Volume 14, No. 3

May • 1959

Land Utilization Committee Report

Water Planning and Development

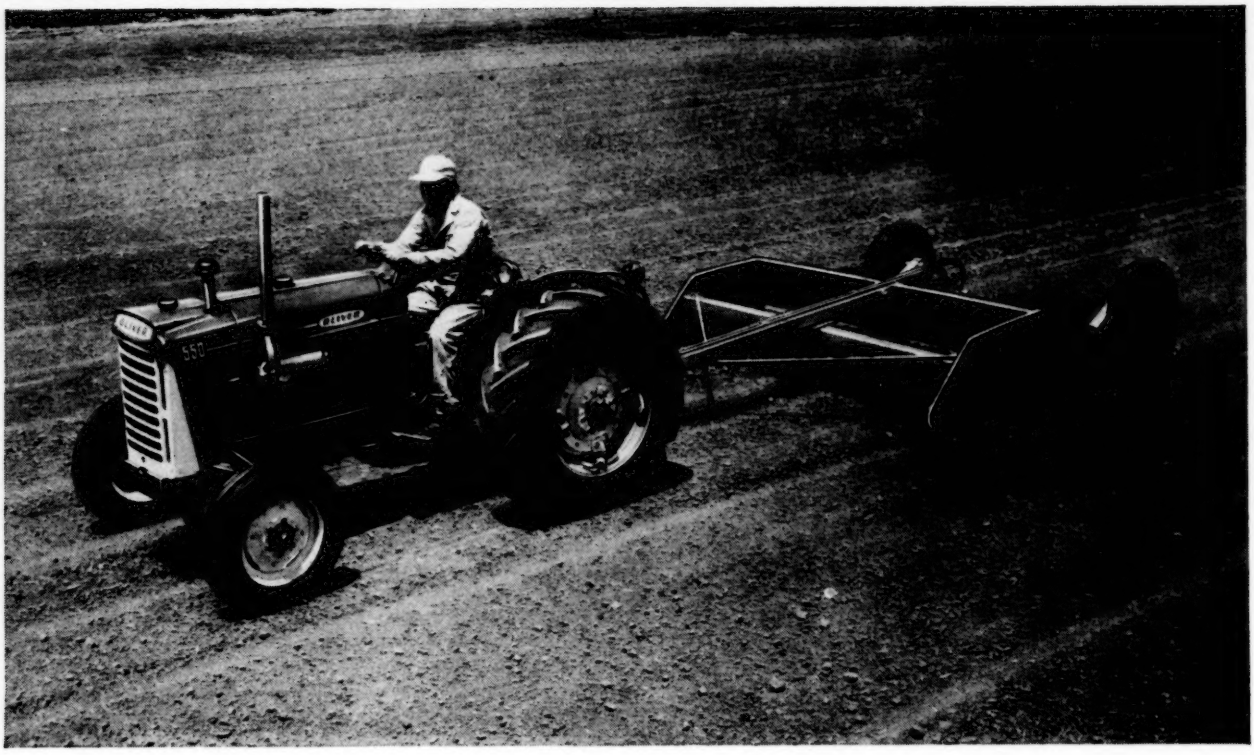
Jute for Waterways

Economics of Run-Down Land

Literature Reviews

SCSA News

Convention Facts



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VOLUME 14
NUMBER 3

TO ADVANCE THE SCIENCE AND ART OF GOOD LAND USE

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CHANGE OF ADDRESS: Notice of change in address should be received two weeks before the date of issue on which the change is to take effect. Both the old and the new address should be sent to the Executive Secretary.

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POST OFFICE ENTRY: Second class mail privileges authorized at Des Moines, Iowa.

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COVER: "Just fishin'"—the birth of many land and water-use attitudes! These two Iowa youngsters did not know that they would be "cover" celebrities, or that the photo was to be a first-prize winner in an Iowa SCSA Chapter photo-contest project. They were simply just fishing! Their father, Ernest E. Behn, SCS work unit conservationist at Boone, Iowa, captured this fine scene of childhood and conservation.

DOUGLAS E. WADE, *Editor*
FELIX SUMMERS, *Contributing Artist*

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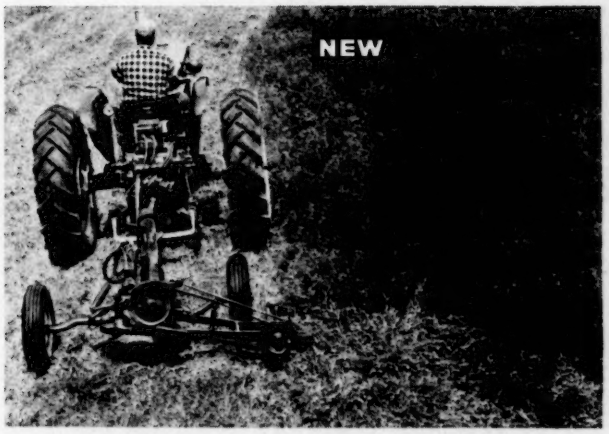

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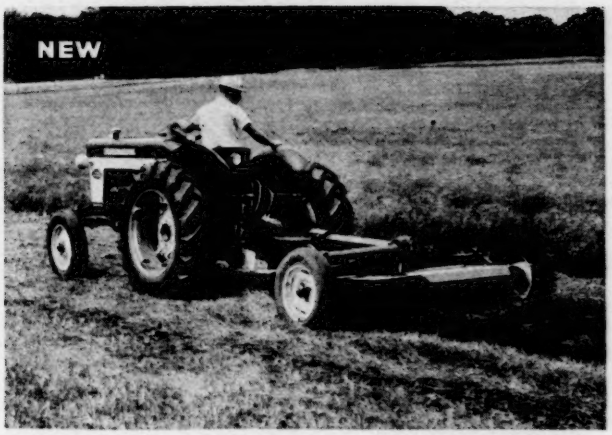

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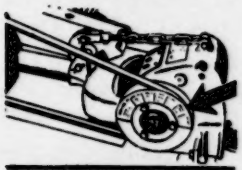

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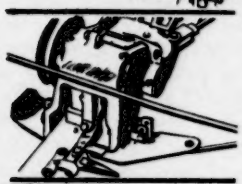

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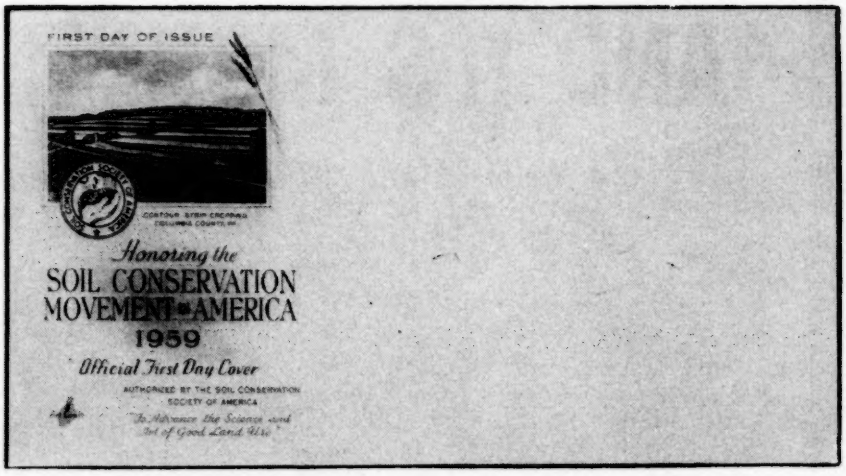
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The Land Utilization Committee Reports

FRANK W. SCHALLER, CHAIRMAN, AND COMMITTEE

The Council of the Soil Conservation Society of America, during its October 1958 meeting held at Asheville, North Carolina, heard the report of the Land Utilization Committee. This committee was commended for its progress. The Council also suggested the report be published in the Journal.

THE SOIL CONSERVATION SOCIETY OF AMERICA has many committees organized to carry out important responsibilities and objectives. The "Land Utilization Committee" is one of these. Members of this committee sometimes feel that their responsibility is somewhat unique and that perhaps "all eyes are upon us." The clue is our Society motto of which we are all proud—"To Advance the Science and Art of *Good Land Use.*"

F. W. Schaller

Committee accomplishments often come slowly especially when the membership is widely scattered and there is no opportunity for conferences. Recognizing this, the Land Utilization Committee has tried to develop clearcut objectives and goals and is extending every effort to maintain continuity of effort from year to year.

Frank W. Schaller has for the past year and 1959 been serving as chairman of the SCSA Land Utilization Committee. He is connected with the Extension Service, Iowa State College, Ames, Iowa, as Extension Agronomist.

The 1958 Committee has worked diligently and some of its efforts are reported here. The presentations are purposely brief but represent appraisals of certain land-use situations and were originally intended to provide ideas for future committee work. The papers indicate activities, trends, needs, expectations, problems and some possible solutions. They have been developed by persons who live in different geographical areas and are employed in several professional fields. We are sure you will find these reports informative and interesting reading.

Here is a preview:

1. Fewer farmers, larger farms and greater efficiency is the trend in the use of agricultural land. This is a result of technology and effort of farmers to adjust to modern farming and improved everyday living.

2. The farm operators of today are fast becoming shrewd businessmen. They understand efficiency and use it. They employ technology and evaluate and select alternatives to achieve their goals. To them good land use implies maximizing the use of resources which must be measured in terms of production and income.

3. Part-time farms and rural residences with no farming are increasing especially in areas where industrial jobs are available.

4. Large acreages of good farm land are being taken out of crop production by industrial and urban growth, highway expansion and recreational development. More land is definitely needed for these purposes but there is a need to encourage orderly and discriminate choices.

5. Some new expressions are appearing with increased regularity in land-use considerations—*urban sprawl, metropolitan web, spatial modulation, natural areas, breathing space* and others. These are familiar terms to some county planning commissions who are aware that city concentration and countryside must be planned to avoid conflict and to insure a satisfactory co-existence.

6. A new national inventory of soil and water conservation needs will be completed by the close of 1959. The inventory, by providing an up-to-date picture of these resources, should be invaluable for planning purposes.

Land-Use Planning and the Farm Business

HERBERT B. HOWELL

Herbert B. Howell is Professor of Economics at Iowa State College, Ames, Iowa. He is Extension Economist in charge of the Extension Farm Management Program.

LAND use and soil conservation are generally thought of as physical in nature, but to the individual farm operator there is more. His purpose is to gain an adequate return on his investment and/or provide a living and security for his family. Thus he not only looks at the physical requirements but also the economic requirements.

H. B. Howell

The farm operator is a manager of the farm business. As a manager, he must not only consider the alternative choices available to him, but he must evaluate these alternatives in light of the expected results and how the results will help him achieve his goals. Goals are the end product of any decision. In land-use planning, the

manager of the individual farm business in considering his alternative does not consider the land by itself but relates land use to the quantity of capital and labor available, the kinds of markets, the risk involved, and his management skills and personal likes and satisfaction.

Land in most areas has limited alternative use except for crop production. In this manner, land differs in economic nature from the other resources used in farming, namely capital and labor. Capital and labor have alternative uses in the rest of the economy and if used in agriculture must give as great or a greater return than if used in some other production.

The fact that land has little if any alternative use except for crop production in the farm business means that the best land-use program on most farms will approach the optimum system in time which will give the greatest total production of the most profitable crop. In determining the most profitable crop over time, it is necessary to recognize the comparative advantages of crops between areas of the country rather than making a decision based largely on current prices. Iowa can produce more grass per acre than Wyoming, but this does not mean this is Iowa's most profitable crop. The most profitable crop over time in any area is the crop that it can produce, with resources available, more efficiently than any other area.

To an individual farm operator, the development of the best land-use program means developing an expectation of the yields that will be reasonably possible under various systems of land use, mechanical practices, and other technology that can be applied. The expected yields will determine the best land-use program in the operator's mind. Land-use technicians need to develop the art of interpreting expected yields from practices. This may seem complicated to many, but represents scientific decision making. By applying costs and expected prices one can measure more precisely the results. The criterion of good management or determining an optimum system is an examination of what would happen to yields over time: (a) if I used more fertilizer or less; (b) if I terraced; (c) if I increased the acres in row crops, or decreased the acres in row crops.

Budgeting (in the form of *Acres* times *Expected Yields* times *Expected Price* minus *Costs*) represents reality in selling a good land-use program. The yield level is not as important in budgeting alternative land-use programs as is the recognition of how production will be affected as reflected in realistic changes or maintenance of yields when changes are made.

Good land use implies maximizing the use of resources to achieve satisfactions. To determine the maximum return possible, the results should be measured in terms of production and income. Determining land-use recommendations based on reasonable yield estimates should help individual farm operators in achieving good land-use programs.

Land Use in a Changing Agriculture

R. H. BLOSSER

R. H. Blosser is Associate Professor on the staff of the Ohio Agricultural Experiment Station with headquarters in Columbus, Ohio. For the past ten years he has devoted most of his time to studying the economics of soil conservation.

AGRICULTURAL land-use patterns have changed in the United States as a result of new developments in farming. More changes in the patterns are probably on their way because of: (1) expanded use of nitrogen fertilizer, especially on corn; (2) use of more irrigation; and (3) a trend toward more part-time farming.

R. H. Blosser

More grain crops are now being raised on level-land than was formerly thought practicable. This change has occurred because high corn yields can be produced on some soils with only a small percentage of legume crops in the rotation if heavy applications of nitrogen fertilizer are used. Also, fertilizer prices have been reduced enough that heavy applications on corn have become more profitable on many farms. Until recently, legume crops were generally considered to be the most economical source of nitrogen for grain crops.

More corn on the level areas should enable many farmers to adopt more effective soil conserving programs on the hilly portions of their farms. This can be accomplished by growing more forages and less grain on sloping land and by shifting some of the steepest cropland to permanent pasture. On some farms, shifting some of the cropland to permanent pasture should eventually lead to reforesting all pasture land that is now too steep to be limed, fertilized and mowed with modern farm machinery. Reforestation might be accelerated considerably if more of the poorer trees could be profitably marketed.

The use of more irrigation will probably result in more intensive grain production on the land involved. This situation should reduce some of the demands for growing crops on the other land. However, a large part of this adjustment probably will occur on an area basis rather than on all individual farms.

More part-time farming should reduce some of the demands to use soil-depleting practices that lead to a reduction in net income. Most farmers recognize the fact that poor soil management is unprofitable over a long period of time. But many continue to deplete soil resources in an effort to maximize present income for a few years. This situation is usually found on tracts of land that are too small today to provide a satisfactory income regardless of the way they are farmed. A job in industry should enable many farmers on small hill farms to reduce the acreage in grain crops or shift some of the cropland to permanent pasture. Also, off-farm employment should make it economically feasible to apply some salary income toward reforesting some of the steep and stony areas that are now used for permanent pasture.

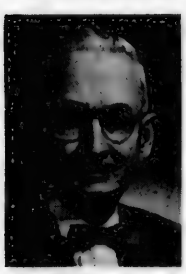
To summarize briefly, more grain crops on the level land and less on the hill areas should be expected to occur if present trends continue. Some of the steeper and poorer permanent pasture land will be permitted to reforest itself. These changes should lead to a more desirable land-use program—one that is based on farming the land according to its capability to produce certain crops.

Trends in the Northeast

ARTHUR B. BEAUMONT

Arthur B. Beaumont retired in 1957 from active service as State Conservationist (SCS) of Massachusetts; however, since that time he has been employed by the SCS as a consultant. He resides in Amherst, Mass.

FROM the information submitted by state conservationists in the New England States, New York, Pennsylvania, New Jersey, and Delaware, the following statement of trends in land use appears to be indicated.



A. B. Beaumont

1. Farms are increasing in size. This trend has been noted particularly within the past ten years with respect to dairy farms.

2. Intensity of land use varies considerably in the Northeast, with greater intensity in the southern portion and less intensity in the northern part. Considerable row-crop land has been converted to grassland in New England. Some of the poorer pasture is reverting to woodland. Some cropland is being planted to trees under the Conservation Reserve Program. On the other hand, some woodland is being cleared and some land drained.

3. The acreage of so-called "idle land" appears to be increasing in southern New England and New York. In other sections of the Northeast idle land is said not to be increasing, and possibly decreasing in Pennsylvania.

4. With the exception of Vermont and Maine, loss of land near the larger cities is increasing.

5. The demands for recreational purposes are medium to high and are generally increasing in all the states except New York.

6. All the states except New York report major shifts in land use (for types see 2 above).

7. New or greater conservation problems, particularly in water, are being created in most of the Northeast. Two states report problems due to urbanization.

8. Part-time farming is increasing, particularly in the urbanized areas where it has recreational implications. Two states report no increase.

9. Integration (contract farming) is restricted largely to the poultry industry and has not seriously affected land use.

10. Farmers, particularly commercial, are becoming more efficient producers. Even with a decrease in the number of farms, total production is increasing.

11. Application of conservation practices is slowly changing the land-use pattern. More tilled land is reverting or being placed in grassland and woodland. Fields are becoming larger.

12. Outstanding current developments in conservation practices are: water management, including irrigation and drainage; flood control structures; ponds for general and woodland fire-protection; tree planting (Conservation Reserve); tile drainage; land smoothing for surface drainage; contour planting of vegetable crops. There has been an increase in demands by urban groups for assistance in drainage and erosion problems.

In 1958 as President of the Soil Conservation Society of America, I appointed these members of the Land Utilization Committee: Henry Adams, Raleigh Barlowe, Arthur Beaumont, Karl Belser, R. H. Blosser, Cecil Chapman, H. B. Cheney, John C. Frey, Herbert Howell, Joe Pierre, Frank W. Suggitt, and Frank Schaller (chairman). (Glade Loughry and Alex Robertson were added in 1959 by President A. C. Watson.)

This committee has been working 'new ground' and has been productive.

***Land utilization is a broad subject area in need of continuous exploration by the Society. The committee has continued under the leadership of Frank Schaller.*—RUSSELL G. HILL.**

Trends in the South

C. W. CHAPMAN

Cecil W. Chapman is State Conservationist, Soil Conservation Service, Athens, Georgia.

IN this discussion are included the 13 states from Virginia to Texas and Oklahoma, and Tennessee and Kentucky.

1. *Farm Size:* In 1940, the average size farm in those states was 124 acres, in 1954 it was 170 acres.

C. W. Chapman

The South has almost 100,000 more owner-operated farms now than 17 years ago, although there are 600,000 fewer farms.

One can expect farms to become larger. The tractor requires more acreage and farm families are needing larger incomes. Size of farm analysis indicates that the average size of the commercial farm selling more than $2,500 in products is 335 acres.

2. *More Intensive Use of Land:* Throughout the South, the acreages of tobacco, peanuts and cotton have had nearly annual reductions for several years. Various technologies introduced as a consequence of increasing reductions have resulted in more intensive land use on the remaining acres cultivated. The acreage of so-called "idle land" and land with only native vegetation remains high. It is estimated that from 1956 to date over 3 million acres of land have been placed in the Soil Bank.

3. *Is the Amount of Land Going into Roads, Urban and Industrial Areas a Serious Problem?*

A recent study reports that three times as much arable land is annually removed from agriculture by conversion to other uses (particularly for urban expansion and highway construction) as is destroyed by erosion. More land-use planning is needed, particularly in urban-rural "tension" areas. Land-use planning must recognize competitive uses of land. Planning activities should be linked together through broad regional planning.

There are no signs of any general shortages of land or its products in the South, although some questions of policy and methods arise from present or prospective demands for land for agriculture, forestry, recreation, urban growth and other uses.

4. *Recreation:* Within the past two decades outdoor recreation has grown into one of the major uses of land in the South, with signs of continuing and rapid growth. There are five obvious reasons for the current trend: (1) the steady rise in population—during the 1950's the average increase has been 1.8 per cent a year; (2) the continuing gain in real income per person; (3) increase in leisure time, with paid vacations longer and more common; (4) people throughout the nation are becoming much more mobile—average number of miles traveled annually per person has gone up about ten-fold since 1900; and (5) facilities and opportunities for, as well as kinds of recreation have increased.

This steadily rising demand for outdoor recreation in the South has not resulted to date in extensive conflict between fairly intensive land use and the preservation of unspoiled or "wilderness" areas. There has been an intensive development and use of farm ponds for fishing, with much research underway to bring ponds into high productivity for fishing.

5. *Land-Use Shifts in Cropland, Pasture and Forests:* Throughout the South there has been a trend from the plow to the cow. Feed and forage acreages supported some 28,432,000 head of cattle as of January 1, 1958.

In addition to the 193,288,000 acres of existing stands of commercial forest land (*Timber Resources Review*), some 21 million acres are considered as plantable area. Some of the land has not been mapped for land-use capabilities. Clear cutting of small woodlands creates new erosion problems. Inadequate preparation of some sites being planted to trees also is a problem.

6. *Part-time Farming:* Of all Southern farms 38 per cent are part-time and residential, 33 per cent sell less than $2,500 per year, and 29 per cent sell more than $2,500. There will be more part-time farmers with increase in industries.

Since 1939, about 25,000 new industries have been added to the South—a rise of about 80 per cent.

7. *Farm Efficiency and Production:* Labor efficiency has risen. In the past 16 years southern farmers have added one million tractors.

Total production has increased with fewer people farming. In 1920, more than one-half the population was on farms; today only about one-fifth is.

Higher prices and bigger volume of production per farm of today will grow as acreages are increased and production per man, per acre and per animal goes up. However, vertical integration (contract farming) of producer, supplier, processor, and retailer has brought down the price of chickens. The same thing is happening to turkeys. Hogs are a possibility in view of expansion of meat-packing facilities.

8. *Developments in Conservation Practices:* Developments in conservation practices consist of stubble-mulch farming, turning of sod for row-crop production, improved water-disposal systems associated with parallel terracing, critical area treatment and roadside erosion-control plantings, establishing sod in the vicinity of water-impounded areas, and channel stabilization. Complete

treatment of entire watersheds is, of course, a new approach.

There are signs in the South that we cannot put our entire faith in technology. The South is learning that conservation is involved not only with conservation of material resources such as soil, water, forests and agricultural lands but also with increases in human populations, particularly in urban areas.

Trends in the Cornbelt

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FEWER farmers, larger farms and greater efficiency in producing farm products are definite trends throughout most of the Cornbelt. These changes have been taking place simultaneously with phenomenal advances in the application of research and mechanization to all phases of agriculture. These trends will undoubtedly continue as further advances are made in technology and as farmers attempt to achieve maximum returns from full-time farming.

J. J. Pierre

Farmers find they need to use up-to-date production methods, and they need certain minimum acreages in order to have the greatest efficiency in use of land, labor, power, machinery and capital. Investment, interest and depreciation costs become excessive on small farms in relation to the amount of time modern equipment is used; and personal-property and other taxes are usually higher than on the larger farms. Furthermore, farm output per man-hour has increased about 26 per cent in the past 10 years. Therefore, one way to attain a higher level of income is to purchase or rent additional land. Other means of getting more income are: (a) increasing livestock and management aspects to a high level; (b) producing specialized products; or (c) supplementing farm income with nonfarm work.

If the trend to larger farms continues, will we not eventually have fewer and fewer major food and fiber producing farms (or corporations), with more and more hired help? What effect will this have on money spent locally for homes and community enterprises, or on the adoption of conservation practices—especially those which are applied by individual owners because of aesthetic values or inner satisfaction rather than because of economic values?

A tremendous acreage of good land is rapidly being taken out of crop production by industrial and urban growth, highway and airport developments, and strip-mine operations. Other needs for land include forests, parks, natural areas, wildlife, defense and recreational areas, reservoirs and flood-control lakes. In the last 15 years approximately 3½ million acres (an area equal to 10 large counties) of cultivatable land in Ohio, Indiana, Illinois and Michigan have been converted to other uses —and the rate is accelerating. This trend causes significant changes in the rural communities affected and in the kind of farm life and farm organizations they have known in the past.

Taxes may become higher on the land remaining in farms. This may happen because of a change in the tax base when some of the land in the community is taken out of production, or because of urban growth and the need for schools, police and fire protection, and other civic developments. Land prices become inflated as urban growth progresses. The incentive for soil conservation and improvement tends to disappear. Water runoff and flooding is intensified and becomes more destructive as more roads and homes are built, and there is a further shrinking of land surfaces where water can be absorbed. If a highway divides a farm, there is often interference with water-disposal systems and conservation measures, and with efficiency of operations, thereby affecting the future productivity of the farm more than the acres sold for a right-of-way would indicate.

The various demands for land cannot be resolved until all users have an understanding of the over-all situation. For example, it is easier and cheaper to build highways on level Class I land rather than steep, rolling, or Class VI land. In cases where alternatives are possible, the best land should be retained for agricultural purposes. When a highway is built, the adjoining lands, unless zoned otherwise, are subject to urbanization. The acreage thus eventually taken from agriculture may become many times greater than that taken by the highway itself.

There is an urgent need for guidance in setting up priority systems that will provide for proper land use. The development and more extensive use of zoning in order to keep better land for agricultural purposes as far as possible appears to be a desirable goal. Zoning should consider *all* uses of the land resources for needs of future generations as well as for the present. Local plans should be integrated with broader-area plans for guidance on new land-use changes.

Achieving protection against further unbridled loss of agricultural lands is a many-fold task involving research, education, fair taxation, credit, sound laws and cooperation.

A coordinated natural-resources policy for the states and the nation, possibly developed, maintained and administered by non-political state natural-resources boards and a national board might be helpful. These boards could serve to guide government action on proper land use. A natural-resources policy published in the JOURNAL OF SOIL AND WATER CONSERVATION (April 1952) is a start along this line.

Conservation measures are being planned and applied on agricultural lands in the Cornbelt at an increasing rate. Soil conservation districts and their local boards working cooperatively with the Soil Conservation Service and other agencies, organizations and individuals have made much conservation progress during the past 20 years. The farm conservation plan has proved to be an excellent base for technical assistance to a farmer in the maintenance and improvement of soil, water, timber and wildlife resources. Soils maps, combined with the land-use plans developed by farmers, are a foundation upon which sound technical assistance can be given.

Research furnishes more and better alternatives in making it possible for more farmers to apply effectively soil and water conservation. Additional research, education and cooperation will help encourage good land use and treatment.

Land Requirements for Urbanization and Highways

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URBANIZATION has become an increasingly important phenomenon in the United States in recent years. Populations have soared steadily upward, particularly in the non-farm sectors of our economy.

R. Barlowe

This growth has brought a tremendous increase in demands for new lands for urban uses. It has prompted the outward sprawl of our cities and suburbanization into what was once open country. The population growth has also developed a need for new commercial and industrial sites, for additional acreages that can be used for parks and other recreational services, and for more land for new highways, streets, parking areas, and airports.

No complete tabulation is available concerning the precise areas which have or which currently are shifting from farm and other open-country uses to these added developments. United States Department of Agriculture estimates, however, indicate that the total acreage in urban areas increased about 395,000 acres per year between 1945 and 1954 while an average of 78,000 acres per year was taken for the construction of new highways. Comparable, if not larger, acreage can be expected to shift to these added uses in the future. The 13-year expanded national road-building program projected after the passage of the Federal Highway Act of 1956, for example, calls for the acquisition of around 2.5 million acres for building, widening, and relocating highways.

No one can predict accurately how much land will be used in the future for additional urban and transportation areas. A general projection is suggested by the following tabulation of probable demands based on future populations of 225 and 300 million persons.

Prospective Future Needs for Non-Farm Lands in the United States*

Types of Land Use	Millions of Acres Used in 1954	Millions of Acres Needed for a National Population of: 225 Million	300 Million
Residential lands	18.6	26.2	33.8
Commercial and industrial	3.0	4.5	6.0
Transportation areas	33.0	40.4	47.4
Recreational lands	32.0	35.3	39.8
Military and defense	21.5	21.5	21.5
Service areas and other	20.0	22.5	25.0
Areas in non-farm uses	128.1	150.4	173.5
Wasteland areas not included in farms	55.5	54.5	53.0
Total non-farm land	183.6	204.9	226.5

*Source: *R. Barlowe, "Our Future Needs for Nonfarm Lands", Land: The 1958 Yearbook of Agriculture, p. 478. Washington: Govt. Printing Office, 1958.*

Like other projections of future land requirements, the worth of these estimates depends largely on the validity of the assumptions used in their computation. Substantially larger areas may well be acquired for recreational, military, and service uses; and the continuation of our current and often 'helter-skelter' practices in laying out subdivision could easily lead to the taking of larger areas for residential, commercial, and industrial uses. On the other hand, careful consideration of the husbanding of our agricultural lands could result in the allocation of smaller acreages to these non-farm uses.

No particular case is made for these projections. They may be several million acres high or low. But high or low, they do indicate that non-farm land needs for a population of 300 million persons might be met with use of about 12 per cent of our total land area. This compares with the 10 per cent of our total land area now used for this purpose. Percentage-wise, this calls for a relatively small change in our over-all land-use situation.

But it still involves a shifting of some 43 million acres to various new non-farm uses.

The significance of our need for additional non-farm lands varies considerably in different areas. Large tracts of farm land may be needed for urban purposes in the urbanized corridors that stretch south from Boston to Washington and west from Buffalo and Pittsburgh to Milwaukee and Chicago and in the vicinity of metropolitan centers. Negligible amounts of land, on the other hand, will be needed for these purposes in many of our highly-productive agricultural areas.

From a national standpoint, it is difficult to dispute the desirability of this expected shift of rural lands to urban and highway uses. More land is definitely needed for these purposes if we are to enhance some of the welfare and well-being of the bulk of our citizenry. The higher land values associated with these uses ordinarily give them "highest and best use" priorities above those currently commanded by agriculture. Furthermore, the problem of farm surpluses and our prospects for increasing agricultural productivity seem to support the supposition that many farm lands are not really needed in their present use.

This picture changes, however, when one considers local situations. In numerous instances, highly-productive farm lands have been used for non-farm uses when other less-productive sites could have been used just as well. Such examples, together with the presence of premature and other undesirable developments, highlight the need for more analysis and planning of the ways in which we can best use land resources. Programs are definitely needed to help guide new land-use developments along the lines most beneficial to society-at-large.

Positive programs of this nature must start with effective and orderly planning for the future. To promote the orderly and efficient development and use of our land resources, there are already many tools to use: public opinion, zoning ordinances, subdivision restrictions, possible subsidies, special taxing arrangements, acquisition of developmental rights, public purchase of properties and other similar measures.

The Conservation Needs Inventory

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THE National Inventory of Soil and Water Conservation Needs was initiated by the United States Deparment of Agriculture in 1956. Eight agencies in the Department are participating in the work, with active assistance from numerous state agencies and bureaus in other federal departments. It is planned to complete county and state summaries by December 31, 1959, and keep them current after that date.

H. R. Adams

The inventory includes the following estimates for every county in the United States:

1. Present acreage of urban and built-up areas and of water areas.

2. Present acreage of cropland, pasture and range, forest and woodland, and other land, by kinds of land (land-capability units). Subdivisions of any of these major land-use categories may be made if desired.

3. Probable changes in acreage of these land uses on the various land-capability units by 1975.

4. Acres of each land use now needing treatment for the principal soil and water conservation problems.

5. The acreage in each watershed having problems that can be met only by formal project action.

These estimates are made by county committees consisting of local representatives of participating agencies, farmers and others. Thus the estimates represent the combined ideas of a group of people who have intimate knowledge of conditions in the county. A uniform procedure is followed that permits the comparison of estimates between counties and the assembly of data into state and national summaries. Guidance is provided by state and national committees made up of representatives of participating agencies.

Nearly all federally-owned land is excluded from the first four of these estimates but not from the fifth one. Much of this federally-owned land is dedicated to specific uses and the managing agencies have developed plans for its use and management so the inventory estimates by county committees are not necessary.

In the past, individual agencies have made studies of soil and water conservation needs. This is the first to have wide-spread participation both within and outside of the U. S. Department of Agriculture. With this broad cooperation, much pertinent source material is made available for use by county committees as a basis for the estimates. Agreement among the agencies as to the source material to be used, the types of interpretation and estimates to be made, and the manner of making them, greatly increases the value of the work. Every participating agency has the opportunity to assist in making and reviewing the estimates and summaries.

The procedure has been developed to provide infor-

mation for many agencies or groups interested in planning agricultural and watershed programs for counties, states or the nation. The presentation of acreage figures for present and future land use by land-capability units will provide a basis for many types of interpretation concerning land utilization. Examples of probable uses of the information are:

1. ASC committees, soil conservation districts, drainage districts and similar organizations can use the estimates as a basis for planning their programs.

2. Extension specialists can get guidance about the need for new or different subjects for educational programs to accompany changes in land use in counties, or sections of the state.

3. The need for some types of research will be made evident.

4. The inventory will provide much information that can be used in setting up priorities for the establishment or improvement of highways, power lines and other public utilities.

5. Construction companies engaged in soil and water conservation work can get an idea of the type and magnitude of the job in a county and can plan equipment and operational needs.

6. Agencies can evaluate the accomplishments of existing programs.

7. State and national agencies can get information for use in planning the distribution of facilities.

8. Areas where there is need for immediate land-use change or land treatment can be identified so that education and work programs can be intensified.

Role and Importance of Planning Commissions for Better Land Use

KARL J. BELSER

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A community plans for the future. Planning is intelligent forethought applied to development for the public welfare. It is concerned with the location of roads, streets, parks, schools, water areas, public utilities. It is also concerned with the general allocation of land for various uses; agriculture, residences, commerce, industry, public facilities, parks, natural areas, recreation.

K. J. Belser

This "looking ahead" takes official shape in the General Plan for a city, a county, or a region. Such a plan enables the community through its legislative body and planning commission to consider alternatives and agree upon a definite set of policies that will govern future physical development and a general physical design to be followed in carrying out these policies. It further enables these bodies to view all specific projects upon which they must act against a clear picture of desirable future development for the entire community. Through the General Plan, private developers can relate their projects to the policies and design expressed in the plan.

In the past, planning and zoning has been thought of chiefly in connection with urban land uses. In areas where there was an intensive use of land, cities zoned in order to minimize conflicts.

In a normal urban situation the distribution of land uses is generally in a pretty fixed proportion—something of the order of 65 per cent of the gross area in residential use, 15 per cent in public and quasi public uses, 5 per cent in commercial use, and roughly 15 per cent in industrial, railroad and similar types of heavy uses. It can be seen that this 100 per cent of urban use makes no provision at all for vacant space *(breathing space)*, farm land or anything else of that nature.

In recent years, county planning commissions have taken a broader, regional viewpoint. It has become obvious, especially in rapidly growing metropolitan areas, that planning for the use of agricultural land is just as important as planning for the use of urban land.

The need for conserving open spaces has become a matter of increasing concern. In 1950 almost two-thirds of the population of the country was urban and 50 million persons were concentrated in the 20 largest metropolitan areas. This structure of evolving urban environment is having a tremendous impact on people. The further fact, that current growth and long-range projections indicate an extremely large percentage of the anticipated increase in and around large cities, only serves to reinforce the position that a real crisis exists.

Urban Sprawl

We have seen endless subdivisions spreading out for miles and miles in patterns lacking in contrast and relief. This process of never-ending extension (*urban sprawl*) has produced alarming problems of almost insoluble character. Here we find millions of people spread out over hundreds of square miles producing serious traffic congestion, sewage disposal problems, and air pollution problems and many other related problems. The excessive expenditures for metropolitan freeways, primarily designed to connect far-flung subdivisions to an urban core, have only served to create a crisis in the central city. Serious re-appraisals have been necessary here and many metropolitan areas are undergoing major surgery in the form of redevelopment at tremendous public expense.

At the same time, a collateral problem stemming from sprawl has been emerging. This is the wearing away of prime agricultural land, which originally gave the urban center its meaning. City and countryside can exist side by side. It is indiscriminate sprawl that defeats urban unity and ruins the countryside for any kind of prosperous agriculture which could bring much relief to the urban scene.

Here then we have the inter-related aspect of the open-space problem in the metropolitan areas:

- On the one hand, we have the need for providing a pattern of open space to relieve the congestion, monotony, and inefficiency of haphazard metropolitan development so that the millions of people enmeshed in the metropolitan web may at least have a modicum of pleasantness in the urban environment.

- On the other hand, we have imperative need to conserve the basic soil resource upon which the food supply for the population and the fiber for industrial raw material is based. Vast acreages of fine farms, grasslands, and orchards, with proper planning, can be made to serve humankind as sources both of food and "breathing space."

Normally, when we have a problem related to the urban structure such as circulation, population density, sewers, water supply, preservation of worthwhile educational and scientific values of natural areas, and recreation, we do not wait to see if this will automatically solve itself as a part of the organic maturing of the urban organism. On the contrary, we evaluate the problem, prepare a plan with the objective of providing a solution, and proceed in an orderly fashion to realize the benefits of the plan.

Thus we must proceed with comprehensive plans for open space. Open space must be handled as a plus factor and not according to the traditional concept that everything that's left over is the open space.

Planning Tools Re-assessed

We are re-assessing the planning tools we already have. *Subdivision* control certainly can be reoriented more in the direction of *"where"*, than as currently, *"how"* to subdivide: urban renewal with an orientation toward breathing life into the urban core by providing open space. Then there is *capital improvement planning and budgeting* with its possibility of meshing public works into the open-space plan, and *zoning* with its possibilities of *controlled densities* and *spatial modulation*.

Besides these old and trusty tools there are new ones being explored. These have to do with reducing urban pressure on existing open space of high economic value to the community, the state, and the nation. We are looking at *faxation* as a tool to encourage development where it should go and to reduce pressure on agricultural and other existing open space, such as golf courses, parks, etc. The idea of *land-use easements* as used in the zoning ordinance, only on a broader scale, and the actual *acquisition of development rights* as a public purpose are likewise being reviewed. The further application of ecological techniques used for the conservation of resources should be applied to soil just as they have been to watersheds, forests and wildlife. Last, but not least, a well-designed public-land acquisition program for recreation, scientific and industrial purposes is needed.

There is certainly nothing very new about most of these tools. The principal idea is a positive orientation of existing regulative devices and a creative approach to the devising of new tools and techniques with the objective of producing a new kind of open space amenity which is pertinent to our new and complex metropolitan situation.

Every effort should be made to bring together, for the production of a meaningful arrangement of open spaces, such diverse elements as recreation, scientific and educational use (natural areas and wilderness), watershed protection, agricultural soil conservation, flood protection, and waterfront reclamation.

There is no reason why, once this objective and its pattern is clearly defined, that it should not be as realizable as any other concept. May we devoutly hope that for the welfare of all concerned a speedy approach to this problem be undertaken. It is still our problem to see to it that the population anticipated in the next fifty years finds itself domiciled, not in slums, but in an environment which is livable, economical and socially acceptable, and contains in much variety and strongly the elements of naturalness.

Water Resource Planning and Development in Agriculture

EDWARD A. ACKERMAN

IT IS NOT TOO EARLY to think about American agriculture during the remainder of this century. The growth of our population and the pace of our technology already are so rapid that they will require decades for full adjustment. Such a situation invites planning; indeed only through planning will many expensive mistakes in developing the nation's land and water resources be avoided.

To illustrate the need for further planning, and its character, I shall comment upon the use of water in agriculture. I shall do this with the aid of some four years of past research on water development at Resources for the Future.

To plan for water development one first must make some assumptions about the agriculture of the future. What sort of agricultural industry, and what kind of demands, shall we plan for?

Although agriculture may not be what the stock broker would call a "growth industry," it still has prospects for vigorous growth in the United States. It must grow, to meet the demands of a nation whose population may double before the year 2000. It must grow if the demands of an ever-improving standard of living are to be met. It must grow if our commitments toward international leadership are to be honored from a strong position.

Economic projections of agricultural output as distant as the end of the century of course are subject to a wide margin of error. Even so, the population outlook alone leads to the conclusion that increase in agricultural output during the next decades is likely to be very large. This is the first assumption to be made about the kind of agriculture we reasonably might plan for: *a much greater output than now, perhaps more than double that of the present day.*

This larger production will be within a nation different from the present one. Most citizens of this future nation will live in cities and suburbs, and will be employed largely in nonagricultural industry. It would not be astonishing if the population directly supported by primary agricultural production fell to 5 per cent of the country's total some time within this century. Moreover, agriculture is likely to be even more closely integrated into the industrial system than it now is. Obviously the city of today could not exist without the products of he country. The dependence of the countryside on the city is less obvious, but equally true. The mechanized, chemical-fed, research-based agriculture of today would only be a shadow of its present form without the efforts of the city. Here then is the second assumption: *the day of agriculture as "a way of life" is over.* Undoubtedly we shall continue to have mystical references to agriculture in this role. But if we plan realistically, we shall plan for agriculture as part of a complex and highly interdependent industrial system. The suburban half-acre already is taking on the social function which the family farm had in days past.

The final assumption applies to the location of people and industry in the future United States. We all have been impressed by the growth of the West, particularly of California in recent years. We now expect California to become the most populous state in the Union. Other sections of the West also will continue to grow, some rapidly. But this should not obscure the planner's view as to where most of the people of the country will continue to live and work. *They will live east of the Mississippi.* Probably two-thirds of the great growth which is expected will take place east of the Mississippi, and half of it from the latitude of Washington northward, within the East. I mention this because public planning no less than private planning should take account of the location of future markets. *The continued location of the great markets for farm products in the East, and particularly in the Northeast and Midwest, is a factor of prime importance.*

This is the general background into which I shall fit some comments on water planning: continually growing needs, and continually growing agricultural production; but a mechanized, industrially dependent agriculture serving an urban nation with the majority of its population in the East.

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Agricultural Use of Water

There are many ways in which agricultural production may be increased. However, I shall consider only the place of water in achieving agricultural growth that is consistent with the interest of the nation at large. Naturally supplied moisture is vital to cultivation. But how important is artifically supplied water to agricultural output? Conversely, how important is agriculture in water use? For agricultural use is only one of several important functions served by water in our economy.

The largest withdrawal of fresh water for any purpose in the United States is for irrigation. (Data used hereinafter, unless specified otherwise, are derived from computations given in Edward A. Ackerman and George O. G. Löf, *Technology in American Water Development*, Johns Hopkins University Press, for Resources for the Future, Inc., 1959.) About 123 million acre-feet of water are estimated to have been applied to 34 million acres of farm land in the United States in 1955. This was about 44 per cent of all the water withdrawn in that year. However, irrigated acreage was only about 10 per cent of the total cropped land in the country for the same year. The value of products from irrigated farms was somewhat higher than the percentage indicated by the acreage. About 12 per cent of the value of agricultural production in recent years is thought to have come from irrigated farms. It is therefore safe to say that agriculture is far more important in water development than artificially supplied water is in agricultural production.

This last assertion is borne out by the disappearance (consumptive use) of water in 1955. Approximately 74 million acre-feet of the water applied to irrigated fields is thought to have transpired from crops and pasture and evaporated during transportation or while standing on the fields. This amount probably was about 80 per cent of all the water that disappeared in the course of withdrawal use.

How important should we expect irrigation water use to be in the future? It often has been said that water is the cheapest form of fertilizer. If this is true, one reasonably might expect additional irrigation to be among the means of adding to agricultural production in the remaining years of this century. Averaged over the past 25 years, irrigated acreage has increased about 1.6 per cent per year. Should this trend continue for the remainder of this century, it would double the present irrigated acreage. During the same period total agricultural production may be destined to increase much more.

Some Questions

To keep pace with needs for agricultural production, therefore, should we expect an accelerated rate of addition to our irrigated lands? Or, to put it otherwise, should we deliberately plan to increase the rate of developing irrigated lands, so as to keep pace with the indicated needs for agricultural production?

Before we follow the natural political inclination to say "yes", it might be helpful to examine costs more closely. Has water unappreciated economic potentialities in further agricultural growth? Is it really the "cheapest form of fertilizer"? The plain truth appears to be that we do not know.

Within the agricultural economy of present-day United States there is a variety of inputs which can result in increased outputs of farm goods. Water is only one, along with organic and inorganic fertilizers, improved plant stock, dry-land reclamation, disease- and pest-control agents, and others. Data on the economic relation of these several means of increasing output are fragmentary. The data on the economic relation of water to each of the other means certainly are inadequate for assigning to water development a more important place than it now has in agricultural growth. To do so would be to plan more or less blindly.

We then return to the rate of irrigated-land increase that has prevailed in the past, the 1.6 per cent. In the absence of other information at least we can follow the honored custom of projecting a trend. Would we be wise in doing so? I think not. This may be made clear by a review of the place and manner of recent irrigation development. In 1955, about 96 per cent of the total withdrawal of water for irrigation was in the seventeen western and Plains states—those beyond the 98th meridian. In these states irrigation water was 82 per cent of the water withdrawn for all purposes. Even considering the irrigation of eastern Arkansas and southern Louisiana, irrigated land increase during the last 25 years has been mostly in the western states. An important part of the increase has depended upon national political policy, which has favored public aid for the development of irrigation agriculture on western lands.

I do not offer this comment as a criticism of that policy. It is possible that such a policy will continue, and the rate of addition to our irrigated land may be the same as in the past. But one may foresee a great difference between the past and the future in this area, which is bound to be reflected in political policy. Past western irrigation development usually was undertaken in the absence of other seriously competing demands for water. There were some conspicuous exceptions, as in the Los Angeles basin, but in nearly all the West the competition of other uses was not a major factor in water planning. However, there are signs that this situation is changing, both in California and in parts of the interior Southwest. As population in these areas continues to increase and nonagricultural employment must be expanded more and more, western water development increasingly will be faced

with nonagricultural demands. It is likely that this situation will be reflected in political policy. It may be illustrated by examining the long-term water demand-supply outlook for nine "southwestern" states: Texas, Oklahoma, Kansas, New Mexico, Arizona, California, Nevada, Utah, and Colorado. More than half of the water withdrawals for irrigation and 60 per cent of the irrigated acreage in the seventeen western states in 1955 were within these nine states. They probably will be in the residence of three-fourths of the population of the West at some time during the remainder of this century. Within this area one may expect the major impact of future western population growth and economic activity.

Nearly all of this nine-state area now experiences high withdrawal in comparison with runoff. If we take present rates of withdrawal per capita, and use them to estimate total withdrawal in the light of population projections, some interesting results appear. Any population projection for so long a time has obvious limitations, but if constructed with care it can be useful in planning. Resources for the Future has constructed a series of tentative projections to the year 2000. For the year 2000 a total national population of 330 million is postulated in the RFF middle range projection. If the growth rates projected in a similar manner for the nine-state region were in fact realized, and if the 1955 per capita rate of water withdrawal continued to that distant year, total withdrawal in these nine states might reach 385 million acre-feet annually. This is almost twice the entire runoff estimated for these states. Disappearance or consumptive use might come to a figure very close to the total runoff. However, it is certain that all runoff cannot be made available for use. Even to approach such availability means a high degree of control in a region with notable cyclical and seasonal fluctuations in water receipts. The last units of storage or regulation would be prohibitively expensive, even if physically feasible. Furthermore, the more intensive the degree of use and reuse as compared with total runoff, the lower the quality of available water is likely to be, especially in downstream areas. This last point bears emphasis because irrigation return flow contributes notably to undesirable mineralization of water courses. At the same time industrial and other water demands press in the direction of higher and higher purity.

A projection of even the present pattern of water use in these western areas thus suggests that irrigation will be competitive with other water uses, and must be so recognized.

This brings us to the next question: will the present pattern of water use in these states be suitable for the future? Here the answer is emphatically "no!" Even now New Mexico is faced with this question in its immediate planning. That state faces decisions on the use of its small remaining unallocated water supply—decisions which are of the utmost importance to its future. The way in which the last supply of unallocated water is used, and the place where it is used, are likely to determine the adequacy of employment opportunity in the state as early as 1975. The significance of these decisions is suggested by this estimate: If a major part of the now unallocated water were devoted to agriculture, New Mexico could provide for about 3 per cent of the estimated additions to the labor force within the greater part of the state by 1975. This situation has stimulated some careful study within the state, undertaken under the auspices of the University of New Mexico, aided by a grant from Resources for the Future, Inc.

Preliminary results from the study already have indicated gains that might accrue to the state through shifts of water from applications of low economic productivity to those of high productivity. Agriculture comes out badly in most comparisons, even in competition with a fish and wildlife allocation. For example, an allocation of a modest amount of water for improvement of fish and wildlife habitat and recreational facilities indicates an appreciably higher potential productivity per acre-foot of water than most agricultural use in New Mexico.

It is obvious that the citizens of any state, or any region, faced with facts like these, will wish to maximize their income and employment. It is equally obvious that additions to irrigated land no longer are synonymous with the general welfare in New Mexico. Nor will they be so in other areas duplicating New Mexico's situation in the future. For New Mexico, for Arizona, and for densely settled sections elsewhere in the nine-state area, political recognition of the secondary priority of irrigation water use is only a matter of time.

Other Water Sources

Before such an assertion will be taken seriously I must comment on hopes which may be held for increasing the actual receipts of water available for irrigation in these arid and semiarid regions. The four possibilities of additional receipts are: Interregional transfer of water, demineralizing saline waters, exploitation of deep-lying aquifers, and weather modification.

Water from the first three of these possible sources is high-cost water, including that from interregional transfer. Furthermore, the importation of water from such distant sources as the Mississippi or Columbia, although physically possible, is no longer politically practical. Every state appreciates the value of its water resources for its own future use, even where they are plentiful. Only within a single state the size of California or Texas can water transfers be planned as a significant contribution to arid-region water supply. This will be high-cost

water, compared with the past—in the upper range of costs that can be supported by irrigation agriculture.

Water from desalting processes, even under optimistic projections, promises to be still more expensive. Costs of desalting are likely to be reduced to those tolerable by nonagricultural uses. However, the known processes do not seem capable of producing water cheap enough for irrigation. The same probably is true of the exploitation of deep-lying aquifers, in spite of the technical improvements which have been made in pumping.

Among all the future possibilities of increasing water receipts in the West, weather modification appears to be *the* indubitably cheap source of water where it is applicable. If we accept the judgment of the Advisory Committee on Weather Control as to physical results, there is no doubt that water cheap enough for irrigation can be produced by this means. The question is, how much? Dr. George Löf and I have attempted to estimate the potential increase of runoff by artificial cloud seeding in the western states. We have concluded that a long-term average additional runoff of about 15 million acre-feet a year might be planned for the eleven western states from this source. About 5 million acre-feet might fall within the nine-state area of the Southwest. No benefit from this source is indicated for the Plains states, including Texas. We offer these figures only as rough approximations, but they may indicate the order of increase the nation could plan upon.

There is, of course, other water in the West available from the precipitation normally received. This is true particularly for the Pacific Northwest and the Missouri Basin. It is water that is not likely to be sought competitively for purposes other than agriculture within the period I have chosen to discuss. If I ignore the details of project economics for the moment, it seems safe to conclude that additional irrigation is possible in the West, especially outside the nine-state area we have examined briefly. There may be water enough for irrigating as much as 15 million acres more, considering the Plains states as well as the Mountain and Pacific states.

Such an expansion of irrigable area, if it occurred, would be impressive. But compare it with the expected, or even the needed, expansion in agricultural output previously described. If 15 million acres could contribute as much as 10 per cent to the present national agricultural output, that estimate would be liberal. I have no hesitation in concluding that the major part of our agricultural expansion between now and the year 2000 will be in the states east of the 98th meridian. This may be to the nation's advantage because that is where the major part of the market will be. The East also has the needed land and water.

A National Point of View

We have now reached a point where we safely can consider future agricultural water development problems from a national point of view. The reason for doing so is obvious: the federal influence in water development policy shows no sign of diminishing. Particularly in leadership toward technical progress and toward comprehensive development, federal participation may be needed indefinitely. What questions might be considered in discharging the responsibilities of that leadership?

The basic problems can be seen clearly if we divide the country into three areas: the states east of the 98th meridian, the nine-state area of the Southwest, and the eight-state area of the Northwest. I should like to summarize the position of each region in terms of knowledge of potentialities and needs for action.

First, the East. This is where the major agricultural development of the future will be. This "region" has the lion's share of the land, the water, and the future market.

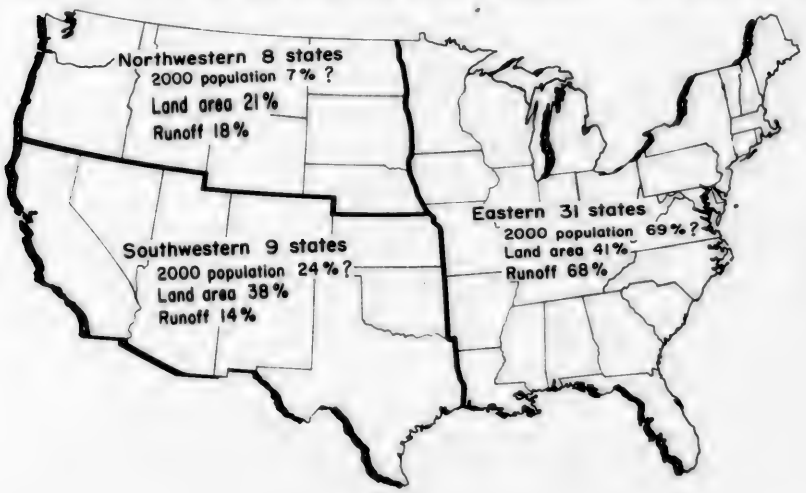

Figure 1. On the basis of three areas, the author summarizes the position of each region in respect to new and anticipated patterns of water use.

As yet, however, irrigation has been practiced only on a modest scale. Aside from soil moisture received from precipitation, water is a minor agricultural input. Perhaps because of this we know very little about its productivity relative to inputs under the conditions prevailing in several parts of the East. Yet when we view such important potential agricultural areas as the lower Mississippi valley the productive promise of water application appears to be of the first rank. An immediate need therefore is rigorous economic evaluation of the relative productivity of water in humid-land cultivation, in the light of modern agricultural technology. I believe that wise and fruitful public investment for water development cannot be made without the findings from such studies. Some studies of this type now are being supported by Resources for the Future, but the subject needs the wider exploration and public reporting that public agencies can give.

▶ Second, the eight states of the "Northwest." These states, which comprise about one-fifth of the total surface of the country, have the land, and they have some water. Now sparsely populated, it is hard to foresee a population in this area during this century that will be more than about a thirteenth of the total for the nation, or with a density more than one-fourth of the average for the entire eastern half of the country. This relation holds true even for a considerably more rapid rate of population growth in these states than for the country as a whole. Consequently further opportunity for the development of irrigation agriculture may be expected there. Regional political pressure for such development also may be expected. Again I see the immediate need as one of obtaining further knowledge. There are three possible reasons for irrigation development in the "Northwest": to supply the growing food demands of the eight states; to export to the southwestern states; or to export to the East on the present pattern. You will notice that I omit the traditional family farm idea. To plan for water development we need to know the size of the market for products from irrigated lands, within the area itself. Even more, we need to know the likely productivity per dollar invested in this area to serve eastern and southwestern markets, compared with dollars invested on farms nearer those markets. We do not know these things at the present time.

▶ Last, the southwestern region. We in the United States have not been accustomed to experience the pressure of population against resources. Local pressures on the land, yes; but we always have had outlets for those pressures, and an ever-improving level of material living. The southwestern states have had a bountiful share of the benefits from our economy. However, within the remainder of this century we shall see the first really serious pressure of population on a given resource in these states. There will not be enough water to go around in the old pattern of use and development.

Comprehensive Water Management

I have suggested already that the new pattern of water use in these states may not be to the advantage of irrigation agriculture. There will be competition between irrigation and other purposes, and the general welfare is likely to be the basis for decision among uses. Where it is, the decision most often will be against irrigation. Politics and the law are certain eventually to follow economics in enforcing such decisions. This assertion does not suggest that irrigation agriculture in these states is faced with a continual outlook of displacement and decline. The extent to which irrigation agriculture will have a place in further water development within this region depends on comprehensive water-management techniques.

By "comprehensive management" I mean the matching of water supply and demand in such a manner that all socially pertinent uses, and all feasible sources of supply, are considered on an interrelated basis. Completely comprehensive management has not been practiced yet in this country. It means not only the multiple-purpose facilities and the basin-wide water control with which we are now familiar. It also means the establishment of efficient standards of consumption for each purpose, and allocation on the basis of those standards. It means development on a multiple-basin pattern as far as that is politically feasible. It means not only integration of ground and surface fresh-water supplies but also integration of atmospheric and saline-water sources with them.

True comprehensive management will press methodically toward new types of water supply; it will press relentlessly toward reducing water use per unit of agricultural and industrial output; it will so allocate water as to use both low-quality and high-quality water effectively. Under complete comprehensive management very little water will be wasted. Economical reuse will be the norm.

Those who are interested in maintaining, or even increasing, irrigated farm production in the southwestern states should be among the first to urge comprehensive water management. If water priorities rest on considerations of general welfare rather than on time precedence, agriculture's thirst not often will be the first served. Hence, the more efficiently water is used, and the larger the water supply, the more water there will be for agriculture. Thus the objectives of comprehensive management are precisely in line with agriculture's interests in these states.

A policy of pressing for comprehensive water management is not entirely in the tradition of United States agriculture. Yet the southwestern agriculture of today and of

the future is likely to find its best interests served by such a policy. These problems of the Southwest should not be regarded as an evil hour for agriculture, but rather as an opportunity.

Conclusion

I have stressed the place of agriculture in the nine southwestern states. That is where the problems are most difficult, where the benefits from planning can be illustrated most clearly, and where the need for policy decision is immediate. But the same reasoning applies to other parts of the nation. That reasoning means:

First, recognize that agriculture will remain a dominant employment base for a minor proportion of the nation's people.

Second, strive to change surviving resource-development policies and attitudes formed at a time when agricultural employment dominated.

Third, begin resource-development planning by projecting the probable location of people and their likely means of support.

Fourth, determine the efficient means of agricultural production for these people wherever it may be.

Finally, manage resources, including water, so as to achieve the needed employment base and the feasible agricultural output.

If agriculture supports such planning it can serve not only its own best interests, but those of the nation.

Jute for Waterways

R. V. D. BROACH, C. S. SLATER, M. T. AUGUSTINE, AND E. E. EVAUL

FLASH RUNOFF is the villain that ruins many a beautifully graded and shaped waterway before erosion-resistant grasses can be established. Lining the channel with sod is an expensive solution at best and for many jobs good sod simply is not available.

A repetition of waterway washouts, actual and potential, were a source of headaches for Edward M. Davis, state conservationist for Maryland. He recalled a coarse jute fabric he had seen around cotton bales as a boy. Would such material spread in the channel give temporary protection against gullying in newly shaped waterways and serve at the same time as a mulch to promote the growth of seedings or transplants that could give permanent protection? How much would it cost to line a channel with jute thatching? How could you tie it down?

Consulting a manufacturer showed that coarse, open-mesh jute fabric could be furnished for less than 20 cents a square yard. If a still more open weave were used, the cost would be somewhat less. Materials were furnished by the manufacturer and tested in several problem waterways.

Figure 1. Jute thatching being pinned in place. Protection of the soil surface and erosion prevention go hand in hand.

One relatively small channel in Anne Arundel County, Maryland, drains an area of 6 acres. It was rapidly developing a gully, cutting back into the field from an overfall where the water empties at a county road. Silt deposits on the road were also a problem and the waterway had washed out repeatedly.

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Open-mesh jute fabrics were furnished by the Ludlow Mfg. and Sales Company, Needham Heights, Massachusetts.

Figure 2. Grading was a first step in stabilizing this gully on a Maryland farm.

Figure 3. After grading and shaping, jute thatching kept heavy rain from washing out the channel before vegetation was established.

Sprigs of Midland Bermuda were planted in the critical area after it was filled for a last time. Bermuda could be used here where no risk was involved of having it spread to become a weed. Then the jute thatching was spread and pegged down. In rains that came later, the thatching caught and held silt instead of washing out. Bermuda grass grew through and over the thatching and knitted it to the ground. By the time the jute had rotted the Bermuda grass was in full control and the waterway was stabilized.

A gully—deep enough to bury a truck—on the Amos Ward farm near Deale, Maryland, was a particularly difficult problem. It extended 400 feet up a natural waterway draining about 80 acres; ground seepage and a spring kept the bottom wet most of the time. This site required more than merely shaping and seeding. A temporary diversion dam was built above the gully head to divert a major part of the runoff and a tile line was put in to reduce seepage and give a controlled outlet to the spring. Even so the filled gully was subject to considerable runoff and generally wet ground conditions.

The jute thatching used to control erosion here was pegged down over the 400-foot length of filled channel bottom to a width of 8 feet. In a heavy rainstorm that occurred in July shortly after the thatching was laid, channel flow exceeded the width of the thatching. Some rilling occurred at places along its margin.

There was no cutting under the thatching in spite of the deeper flow in the channel bottom. It appeared here that the thatching had prevented a major channel washout before any growth of grass had occurred and the total damage done was negligible. Reed canarygrass that had been sprigged in under the thatching came up nicely and together with other grasses gave evidence in the fall of having completely stabilized the area.

The jute thatching used on the Amos Ward farm had

Figure 4. Grasses (sprigged reed canary grass was used) then took over and stabilized the waterway.

strands about ¾ inch apart. This was compared with a coarser meshed thatching with strands about an inch apart in a roadside ditch that was cutting badly near Anacostia, D. C. The ditch was seeded and the thatching laid in April. In the fall when inspection was made the ditch was completely stabilized with vegetation over both types of thatching; deposition rather than erosion was taking place. In some places the thatching was buried 4 inches deep. We don't know yet how open in spacing (and cheap) jute thatching can be and still stop erosion and get vegetation established.

The use of jute thatching for erosion control on difficult sites has looked good wherever it has been tried. So far it has been used in several states on impoundment inlets, along roadsides, in ditches, on over-falls, and in other waterways on sites ranging from heavy upland subsoil in northern Maryland to light sands along Chesapeake Bay.

Figure 5. A terrace on a New Jersey farm empties directly into this waterway which was protectively-lined with jute.

Figure 6. Terrace and waterway get permanent protection from grass seeded when thatching was laid.

Where the jute has been less than satisfactory the trouble can be charged to unfamiliarity with its proper use. We have found, for example, that loose soil should be packed after, and not before, the thatching is laid. This insures that water will run over and not under the jute. Water that runs through and under the jute can cause washouts.

The wooden pegs that were first used to fasten the thatching were unsatisfactory in some cases. Straw and other debris in the runoff water caught on the pegs and diverted the runoff out of the thatch-protected channel. Long wire staples that can be driven flush with the ground are better from this standpoint.

Actually we do not know just how much pegging is necessary. The thatching clings and shapes readily to the ground surface. After a rain most of the strands are sealed to the surface by sediment washed into and around the strands.

Jute thatching serves better the purposes of mulch. It is easier to lay and hold in place. It has the tensile strength and weight to resist severe conditions of water flow and erosion. Its cost, for critical areas is not prohibitive. These factors make jute matting one of the most promising materials we have encountered to control erosion and get vegetation established in critical waterway areas.

Figure 7. Jute thatching stopped hazardous erosion in this roadside ditch as effectively as sod. (Highway No. 5, ¾ mile southwest of Washington, D. C.)

Figure 8. You can't see the thatching, but it is still in the ditch. Clarence Slater inspects effectiveness of thatching and tall fescue Ky. No. 31 in stabilizing the ditch and road bank.

Economics of Building Up Run-Down Land

R. H. BLOSSER

THE FOLLOWING DISCUSSION briefly summarizes the results of two studies designed to determine the profitability of building up the productive capacity of run-down farms in southeastern Ohio. The first study was made for a dairy farm. The second one was made for a farm having a beef breeding herd. Both showed that above average management is needed if farm earnings are to finance the establishment of a major soil-improvement program.

How Studies Were Made

Income figures from privately-owned farms are rarely suitable for studies of this type because few farmers keep all other factors constant while adopting a soil-management program. In recent years, farmers have adopted many practices that have no relationship to improving soil productivity. Unless all other factors remain the same over a period of time, or can be accurately measured, changes in income on actual farms cannot be attributed solely to better soil management.

In this study, the economics of establishing a major soil-improvement program were determined by farm budgeting procedures. This method produced income figures that changed only as a result of the soil-improvement program. Farm production was determined from the best research data available. Detailed calculations included crop production, livestock numbers, capital requirements, labor needs, receipts, expenses and net income.

For the dairy farm, each item was calculated for 13 consecutive years. But on the beef farm, the period of improvement covered only nine years. More time was needed for the dairy farm because productivity of the cropland had been depleted to a lower level than existed on the beef farm. The dairy farm had a higher percentage of cropland than the beef farm.

Soils considered were Muskingum and associated types which are roughly representative of about 15 million acres of land in southern Indiana, southeastern Ohio, and the northern parts of Kentucky and West Virginia. These soils erode easily because of steep slopes that range from 10 to 30 per cent. Soil maps often show that more than half of the original topsoil has been lost from the cropland. Muskingum and associated soils are unglaciated and have developed from sandstone and shale They are acid in reaction except where liberal amounts of lime have been applied recently.

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How Crop Production Was Determined

Acreages used in calculating crop production are shown in Table 1. Calculations showed that this amount of land would be needed to employ a farm family full time in dairying or beef farming. No reduction in the acreage of grain crops was considered to be necessary for soil improvement purposes. But contour strip cropping would have to be used on the steep slopes.

TABLE 1
Land Use on the Dairy and Beef Farms

Land Use	Dairy Farm (Acres)	Beef Farm (Acres)
Corn	12	22
Wheat	14	22
Oats	0	13
Meadow	34	75
Rotated land	60	132
Permanent pasture		
Suitable for improvement	30	120
Unsuitable for improvement	6	48
Woods	17	150
Miscellaneous	7	50
Total	120	500

Acres in corn were less than the combined acreage in wheat and oats because small grain could be raised on some of the land that was too steep for corn. Oats were used only to keep wheat acreage within current allotments. Permanent pasture was classified unsuitable for improvement when it was located on slopes that were too steep to be limed, fertilized and mowed with modern farm machinery.

Yields used in calculating total crop production for the rotated land are shown in Table 2. Yields for the dairy farm in the run-down condition were based on fertilizer applications of only 100 pounds per acre of a 3-12-12 analysis on corn and wheat, no lime, and no contour strip cropping. Yields for the beef farm in the run-down condition were based on fertilizer applications of 200 pounds per acre of a 3-12-12 analysis on corn and small grain, one-half ton of lime every four years, and no contour strip cropping.

TABLE 2
Yields Used in Calculating Crop Production for the Dairy and Beef Farms

Crop	Before Improvement Program	During Improvement Program Rotation Periods First	Second	Third	Fourth
Dairy Farm					
Corn, bu.	35	50	58	62	65
Wheat, bu.	18	22	24	25	26
Hay, tons	1.0[1]	1.0[1]	2.0[3]	2.5[4]	2.8[4]
Beef Farm					
Corn, bu	45	55	62	65	—[5]
Wheat, bu.	20	23	25	26	—
Oats, bu.	30	35	38	40	—
Hay, tons	1.2[2]	1.2[2]	2.2[3]	2.8[4]	—

[1] Timothy only
[2] Timothy with some red clover
[3] Red clover and timothy with some alfalfa
[4] Alfalfa, clover and timothy
[5] Soil resources on beef farm not as poor as on dairy farm at beginning of program; hence less time needed to maximize yields on beef farm

Crop yields under the improvement program were based on using contour strip cropping on the steep slopes and heavy applications of fertilizer and lime. Corn, wheat and oats were assumed to be fertilized with 250 pounds per acre of 5-20-20 analysis. First year meadows were top dressed with 200 pounds per acre of 0-20-20 fertilizer after making the first crop of hay. Applications of lime were based on the needs shown by tests for Muskingum soils. Specific amounts included an initial application of four tons per acre of agricultural ground limestone; two tons were used for the next rotation; and one ton each rotation was used thereafter for maintenance.

Rotation pasture yields were based on the type and estimated amount of hay that could have been harvested. Permanent pasture yields before the improvement program was started were based on using no fertilizer and lime. Yields of permanent pasture during the improvement period were based on using three and one-half tons per acre of agricultural ground limestone followed by one ton every four years, 425 pounds per acre of 0-20-20 fertilizer every three years, and one mowing each year to control weeds and brush.

Livestock Numbers

Ohio livestock feeding standards were used to determine the number of animals that could be kept before and after the establishment of the soil-improvement program. On the dairy farm, the number of cows could be increased from 10 to 20 on the basis of the additional feed produced. No change would occur in the number of fat hogs sold if average dairy cows were kept. About 27 hogs could be raised and marketed each year without buying any additional grain. But if top-producing cows were kept, the number of fat hogs sold would decline from 23 to 11 if no additional corn were purchased. This decline in hog numbers would occur because high-producing cows require about 1000 pounds more grain per animal than average ones.

On the beef farm, the number of cows could be increased from 32 to 55 on the basis of the additional feed produced in the ninth year of the soil-improvement program. The number of slaughter cattle raised and sold could be increased from 24 to 43. This is based on feeding all young cattle to average slaughter weights of 850 pounds, except the ones selected to replace about 15 per cent of the old cows sold each year. Small amounts of corn should be available each year for fattening hogs until the seventh year of the program. But from then on, the beef herd would require all of the corn the farm would produce.

Changes in Annual Income

Returns to labor before and after the establishment of the soil-improvement programs are shown in Table 3. Inventory increases were omitted from these calculations because they could not be withdrawn from the farm business, and at the same time used to produce more income later. However, a four per cent interest charge on all capital invested was included in the costs of operation. Prices used in calculating gross receipts and production costs were averages received by Ohio farmers, for a five-year period. These years were 1950-54 for dairy and 1951-55 for beef.

TABLE 3
Returns to Labor[1] and Number of Hours Used Before and After Establishing a Major Soil-Improvement Program

Year	Average Dairy Management Return to Labor	Average Dairy Management Hours of Labor Used	Top Grade Dairy Management Return to Labor	Top Grade Dairy Management Hours of Labor Used	Top Grade Beef Management Return to Labor	Top Grade Beef Management Hours of Labor Used
0[2]	$ 405	2025	$1875	2050	$1742	2223
1[3]	–812	1908	487	1984	–687	2298
2	–217	2100	1046	2170	–620	2427
3	–366	2244	890	2308	–351	2556
4	698	2346	2130	2414	56	2660
5	1015	2485	2619	2563	1661	2807
6	1187	2604	2931	2686	2016	2899
7	1332	2735	3230	2815	2358	2963
8	1618	2867	3682	2945	2876	3046
9	1819	3018	4030	3100	3260	3068
10	2146	3121	4507	3207	—	—
11	2313	3204	4823	3294	—	—
12	2452	3278	5142	3378	—	—
13	2717	3356	5514	3454	—	—

[1] Does not include any increases in inventory; but does include a 4% interest charge on all capital invested
[2] Before soil improvement program was established
[3] Years 1-13 represent period of improvement on dairy farm; years 1-9 represent period of improvement on beef farm

Average dairy management included cows averaging 7000 pounds of 3.5 per cent milk which was sold on the grade B market. Price used was $3 net per hundred-

weight after deducting hauling charges. Top grade dairy management included cows averaging 10,000 pounds of 3.5 per cent milk which was sold on the grade A market for $4 net per hundred pounds. Top grade beef management included a 93 per cent calf crop raised to marketable weights and slaughter cattle grading good. Receipts for this kind of cattle were figured at $24.00 net per hundred pounds.

For the dairy farm, annual cash income was calculated to decline for the first three years of the soil-improvement program. But from the fourth year on, cash income would be considerably higher than before any changes were made. For the beef farm, annual cash income would decline for the first five years of the program. These losses in income were largely due to heavy expenditures for lime and fertilizer, and not to reductions in gross receipts. Smaller applications of lime would have reduced immediate costs, but they also would have delayed the time when net income would be maximized.

Time Needed to Finance Program

Calculations also were made to determine the length of time needed to finance the soil improvement program out of cash receipts and increases in inventory. In calculating annual expenses, all family labor was assumed to be paid $0.75 an hour plus the use of a house, and four per cent interest was charged on all capital invested. These computations showed that an average dairy farmer selling grade B milk, would need about 45 years to finance the soil improvement program out of cash receipts and increases in inventory. But with top grade cows and grade A milk prices, only three years would be required. A top grade beef farmer would need about seven years. An average beef farmer would not be able to finance the project from farm earnings if labor and capital were paid prevailing rates.

A soil-improvement program can increase net income in two ways. One is by increasing the returns per unit of labor and capital used. This is often called *more efficient operation*. The other is by providing more hours of work and greater use of capital. This is often referred to as *increasing the volume of business*.

This study shows that if an average dairyman depletes soil productivity to extremely low levels, he will have considerable difficulty financing a rebuilding program out of current farm earnings. This is due to the fact that he does only slightly better than break even on a good farm when he pays himself average wages.

Major soil-improvement programs should be easier to finance with dairy cows than beef breeding herds. A full-time beef operation will require the improvement of almost three times as much cropland and permanent pasture as a dairy farm. However, part-time beef farmers on small farms should be able to finance a major soil-improvement program easier than preceding figures indicate. Reasons include: smaller investments in lime, fertilizer and additional livestock. Also a job in town often pays considerably more per hour than beef cattle.

Major soil-improvement programs often require several years to pay for themselves, even under the best management. On many farms, costs of liming cropland may not be fully recovered until a meadow crop has been produced and marketed through livestock. Several years usually are required before benefits of permanent pasture improvement are completely realized. Better meadows cannot increase corn yields until residues are plowed under. Consequently, soil improvement above a maintenance program should not be expected to completely finance itself the same year it is established.

Although this study shows that major soil-improvement programs can be financed out of current farm earnings, it also shows that net income will be considerably higher over a period of time if soil productivity is maintained at a reasonably high level. Soil-depleting practices lead to lower crop yields and a smaller volume of business when these crops are fed to livestock. This condition can easily reduce total returns to labor to one-half the amount received under a good soil-management program.

Figure 1. A top-grade farmer can finance a major soil-improvement program out of farm earnings. However, he will find it more profitable to operate land that has been kept in a reasonably high state of productivity.

Field Notes

SOIL MAPPING PROGRESS

More than 41 million acres of the U. S. land area were mapped by soil surveyors for agricultural and other uses during the 1958 fiscal year, according to a recent report from USDA. This was an increase of 18 per cent over the area surveyed during the 1957 fiscal year.

This mapping is part of the National Cooperative Soil Survey, a state and federal project for mapping and describing all soils in the U. S.

Including the 1958 acreage, the total acres surveyed in the U. S. reached 575 million, or approximately 30 per cent of the 2 billion acres of land in the Continental U. S.

The maps are used primarily by farmers and professional agricultural workers to plan land use, conservation, and production programs. Such maps are the basis for soil-saving farm plans in the nation's 2,800-plus soil conservation districts.

WATER MANAGEMENT BECOMING MORE DIFFICULT

The Water Pollution Control Section, U. S. Public Health Service, Washington, D. C., predicts an added pollution load in the nation's streams. Speaking recently at an engineering conference, R. H. Holtje (P.H.S.), pointed out that water running off the land, carrying silt, fertilizers, insecticides, weedkillers and other chemicals with it, may become an important source of pollution.

WATER RESOURCES ARCHIVES

A Water Resources Center Archives has been organized at the University of California as part of a University-wide research program on water resources. Its objectives are to acquire unique material not generally available and to locate and describe data in public and private agencies concerned.

Soon to be published is a listing of these on legal, economic and engineering aspects of water resources submitted for higher degrees at the University's various campuses from 1900 to date. Work is in progress on an index of important data located in the files of the U. S. Forest Service at Berkeley and San Dimas.

The Archives, at 242 Hesse Hall, University of California, Berkeley, welcomes gifts of this nature, particularly unpublished reports and those issued in limited editions. This activity is under the direction of J. W. Johnson, professor of hydraulic engineering, University of California, Berkeley.

"SLICK SPOT" TRACER

"Slick spots" in fields may be caused by moisture movement into wet areas from adjacent soils, according to field and greenhouse studies at the University of Idaho.

Radioactive sulfur, in the form of diluted sulfuric acid soaked in a wad of absorbent cotton, was used to trace the pattern of moisture movement into the slick spots. The radiotracer was placed in adjacent soils at different depths. After several months, the tracer was found in samples of soil and in plants taken from the slick spots.

This finding may provide a partial answer regarding formation of slick spots, and may lead to better methods for reclaiming these problem areas.

FALLOUT DECONTAMINATION

A sprayed-on and raked-off asphalt emulsion shows promise as a practical way to remove surface fallout contamination from croplands after a peacetime nuclear accident or in some future atomic conflict.

The water-soluable emulsion is one of several decontamination treatments under test by University of California soil scientists at Berkeley in an AEC-sponsored project, part of a larger research effort to study the passage of radioactive strontium 90 from the soil to plants to animals and finally into human bones.

In small-scale plot tests at Burris Park, Kings County, researchers found that the cold asphalt emulsion could pick up and remove surface soil particles containing up to 97 per cent of the radioactive fallout material. This high effectiveness and the relative low cost of the emulsion have prompted U. S. Department of Agriculture researchers to begin large-scale field testing of the treatment at the USDA research center in Beltsville, Maryland.

Also effective but more expensive was a leaching treatment using hydrochloric acid or ferric chloride followed by plenty of water to remove the radioactive chemical from the surface anl distribute it downward below the normal root zone.

Deep plowing to bury the contamination was partially effective, depending on the plants and soils involved, U.C. scientists said. Barley grown in soil containing strontium 90 at the two-foot level was only one-tenth as radioactive as barley grown where the "hot" chemical was placed two inches below the surface.

Spreading lime on the soil can reduce the contamination danger in areas of acid soil because calcium in the lime competes with the strontium as a plant nutrient. However, since farm soils of the west and southwest U. S. commonly contain from 5 to 10 per cent lime, adding more lime in these areas would be of little help.

Differences in strontium uptake caused by irrigation were also examined in California. Non-irrigated barley had sparser top growth and a higher concentration of radioactive material by weight. Irrigated barley had more top growth, lower radioactivity, but a greater content of strontium 90 in the total crop.

The Berkeley scientists are continuing their experiments to determine how differences in soils, plants, climates, and other factors affect the uptake of strontium 90 by crops.

CIVIL DEFENSE FOR RURAL AREAS

A rural program considered basic to individual and national survival is being worked out through meetings of rural leaders with U. S. Office of Civil and Defense Mobilization, Executive Office of the President. W. L. Shaffer of Battle Creek, Michigan, is director of the Rural Activities Office (in Battle Creek) and can supply additional information to interested groups.

NATION-WIDE FARM CENSUS

Starting in late October this year, the U. S. Bureau of the Census will conduct the 17th nationwide farm census.

Accuracy of the census depends upon records kept by each farmer. Information obtained will reflect the results of dynamic agricultural progress and adjustments in recent years resulting from the unprecedented application of science, technology and research to farming.

NASCD LEADERS

The 13th annual convention of the National Association of Soil Conservation Districts was held February 1-5 in Houston, Texas, and the following officers were elected:

Bill Richards, Orleans, Nebraska, was elected president to succeed Nolen J. Fuqua, who has headed the organization for four years. J. Gilbert Cox of Elliston, Virginia, was elected national vice-president.

Area vice-presidents include Howard Thornburg, Barboursville, W. Va., Area I; Newman Buck, Mt. Pleasant, S. C., Area II; C. P. Crawford, Winona, Minn., Area III; Marion Monk, Batchelor, La., Area IV; Tony Krebs, Quinn, S. D., Area V; James Nessen, Howell, Utah, Area VI; Max Wilson, Lompac, Calif., Area VII.

New directors, elected for two year terms were Hans Van Leer, South Lincoln, Mass.; Oscar Loper, Rock Springs, Wisc.; R. Sloan Rainwater, Walnut Ridge, Ark.; Otis Tossett, Lansford, N. D.; and J. David Lee, Thatcher, Ark. Reelected for two year terms were J. Fred Pace, Marrowbone, Ky., and J. W. Cornwall, Fairfield, Wash. A. D. Holmes of Gallion, Ala., and W. C. Howard of Quanah, Texas, were elected to the board for one year to fill out unexpired terms.

At least eight of the NASCD leaders are members of the *Soil Conservation Society of America*.

AN ASPECT OF LAND USE

Justification for a bill (H.B. 472) introduced into the Oregon legislature to prevent destruction of stream beds, lies in the value of gravel deposits for spawning grounds. According to *Fishing and Hunting News* (Spokane) for March 6, the stream bed spawning grounds (305 acres) of the Fraser River is worth at least $160,000 per acre annually for production of sockeye salmon. The 1958 sockeye pack was worth $50 million at the cannery level, thus accounting for that value. Calculated at an interest rate of 4 per cent, the gravel left in the stream for use as sockeye spawning beds has a capital value to the economy of at least $4 million per acre!

WILDERNESS BILL

A revised Wilderness Bill has been introduced in the Senate and the House of the U. S. Congress.

Essentially, the Wilderness Bill would do only three important things:

- It establishes wilderness preservation as a policy of Congress and applies this policy to areas of federal land, such as parks, forests and refuges, where wilderness preservation fits in with other programs.

- It makes it impossible for a bureau chief or Cabinet officer to abolish a wilderness area, reduce it in size or add to it, merely by affixing his signature to an executive order.

- It gives the general public—the people who own the public lands—a voice in saying what shall be done with the wilderness areas. This voice would be exercised two ways—at public hearing and through elected representatives in Congress.

The Bill has been opposed by certain state, federal, national and local organizations, some of which have been concerned with water and others with mining rights, grazing rights and forestry.

Proponents of the Bill have expressed much surprise that agencies and organizations concerned with water conservation have opposed the Bill, since water conservation and soil conservation are inseparable. Proponents point out that wilderness areas are among the best water and soil laboratories we have.

Theodore Roosevelt, who early recognized the tremendous watershed potentials of unimpaired forest lands, also placed protection of "beauty" at the top of and far above all conservation goals.

GRASS AS NATIONAL FLORAL EMBLEM

A fitting tribute was paid to grass by the late Senator from Kansas, John James Ingalls, who in 1872, under the title "Bluegrass," wrote these immortal words:

"Next in importance to the Divine profusion of water, light and air, . . . may be reckoned the universal beneficence of grass. . . . Grass is the most widely distributed of all vegetable beings, and is at once the type of our life and the emblem of our mortality. . . .

"Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass-grown like rural lanes, and are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal. . . .

"Its tenacious fibers hold the earth in its place, and prevent its soluble components from washing into the wasting sea. It invades the solitude of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains, modifies climates, and determines the history, character and destiny of nations. Unobtrusive and patient, it has immortal vigor and aggression.

"Banished from the thoroughfare and the field, it bides its time to return and when vigilance is relaxed, or the dynasty has perished, it silently resumes the throne from which it has been expelled, but which it never abdicates.

"It bears no blazonry of bloom to charm the sense with fragrance or splendor, but its homely hue is more enchanting than the lily or the rose; it yields no fruit in earth or air, and yet would its harvest fail for a single year, famine would depopulate the earth . . ." (From a folder, *In Support of Grass as Our National Floral Emblem*, Kentucky Bankers Association, 1959.)

COMING EVENTS

time to attend
SCSA ANNUAL CONVENTION
AUG. 26-28
RAPID CITY • SOUTH DAKOTA

American Association of Agricultural College Editors Meeting, Gainesville, Florida, July 12-15.

The annual meeting of the **American Fisheries Society** will be held at Clearwater, Florida, September 16-18 (Fort Harrison Hotel). On or about May 15, 1959, the American Fisheries Society will publish its annual volume, known as *Transactions*, as a quarterly journal of fisheries. This vital publication is obtained by holding membership in the Society.

Annual Meeting of the **National Association County Agricultural Agents,** Kansas City, Missouri, Sept. 6-10.

The National Grange will hold its 93rd annual convention in Long Beach, California, Nov. 9-17, 1959.

National Plant Food Institute, annual convention, White Sulphur Springs, West Virginia, June 14-17.

The Southeastern Association of Game and Fish Commissioners will meet in Baltimore, Maryland, October 25-30.

Third International Course in Hydraulic Engineering will be held from Oct. 21, 1959, to Sept. 9, 1960, at Delft, the Netherlands. Those interested should apply to the Netherlands Universities Foundation for International Co-operation, 27 Molenstraat, The Hague, the Netherlands.

The Western Association of State Game and Fish Commissioners will meet in Portland, Oregon, June 28-July 1.

Book Reviews

THE ECONOMISTS DISCOVER WATER RESOURCES

Recent water shortages, together with federal budgetary unbalance, have attracted graduate students in search of thesis topics and foundations subsidizing research to the field of water resources. The three books here reviewed* all approach the public development of water resources from the same frame of reference—whether federal water projects can be economically justified on essentially the same grounds as private economic activity—but each study selects different projects for detailed critical review. It is in the appraisal of particular federal water projects that these books make the greater contribution, rather than in the somewhat overly elaborate treatment of the nature of economic analysis and its significance for the water problem.

McKean selects the Green River Watershed and the Santa Maria Project as case studies to review the benefit-cost procedures of the Department of Agriculture, the Bureau of Reclamation, and the Army Corps of Engineers. Eckstein, after critical analysis of federal benefit-cost techniques, considers the practices of essentially the same agencies in their responsibilities for flood control, navigation, irrigation, and the development of power. Krutilla and Eckstein, after an extended introduction to economic analysis, discuss the Hells Canyon Case, the Alabama-Coosa River System, and the Willamette River Case along with a lengthy treatment of the "social cost" of federal project financing. There is much overlap in the "stage setting" and general approach of each of these studies, but the three works are important contributions in the application of economic analysis to water resource problems. Any one of these books will increase the knowledge of the non-economist *and* the economist, and the studies are sufficiently different—at least in important areas of application—that all can be profitably consulted by those interested in water resource problems. But these books have been written with more than an ear to the reactions of the authors' fellow economists, and at times the terminology may distress the non-economist—or even the economist—as in the case of Chapter 2 of the work by Krutilla and Eckstein. Because of its felicity of expression and somewhat superior general treatment of the subject, the McKean book is recommended over the other two. The serious student of water resource problems should be acquainted with each of these books, however, since each makes a special contribution to different phases of the problem.

A common point of departure is followed by each author in the analysis of the water resource problem. The basic issue of water resource development is presented as one aspect of the broader economic problem of the allocation of scarce resources in our economy. The need to decide among various ways and times for the use of resources occurs in all societies, although in the United States the private market normally performs this function with little direct supervision or centralized planning. An important by-product of market-direction of production is the establishment of the "value" or price for commodities and services and thus indirectly for the resources employed in their production. The selection of production schedules and the consequent allocation of resources in the American economy follows largely from consumers' decisions in making purchases. It may therefore be argued that these market decisions provide ready-made guidelines indicating what society wishes produced in the economy. Accepting this proposition with only minor reservations, the three authors are virtually unanimous in holding that the public development of water resources is economically justified only when the yield in consumer satisfaction is at least equivalent to that which would be obtained by developing a given sector of the private economy. This contention involves more than the issue of whether water resources should be developed by public (versus private) interests—a frequent basis for controversy in electrical power expansion — but whether public development of navigation, flood control, irrigation and the like leads to inefficient use of land, labor, and capital that might be more productively employed through private enterprise. The necessary assumptions of this position are that (1) there is full employment, which enforces a decrease in private consumption and investment to attain an increase in public investment, and that (2) the value (price) expressions recorded in market transactions are valid measures of the social worth of output. If these conditions hold, the "benefits" of a federal project consist in the value of its output as indicated by the prices of equivalent products

* Otto Eckstein, *Water Resource Development: The Economics of Project Evaluation* (Cambridge: Harvard University Press, 1958), 300 pages, $6.50; John V. Krutilla and Otto Eckstein, *Multiple Purpose River Development: Studies in Applied Economic Analysis* (Baltimore: Johns Hopkins Press, 1958, published for Resources for the Future, Inc.), 301 pages, $4.50; Roland N. McKean, *Efficiency in Government Through Systems Analysis, With Emphasis on Water Resource Development* (New York; J. Wiley & Sons, 1958, a RAND Corporation Research Study), 336 pages, $8.00.

sold in the private market, and "costs" are the sum of the market prices of resources required to achieve the project output. If follows—if the above assumptions are accepted—that when the "benefits" of the federal project exceed its "costs" at a rate equal or higher than that obtained by resources in the private sector of the economy, the federal project is economically justified.

Although all of the authors acknowledge some reservations in accepting the social adequacy and accuracy of market valuations as a basis for appraising public investment, this is the only standard employed in the critical analysis of the procedures of the federal agencies responsible for water development projects. Since many areas of government resource use—education, national defense, public health—appear clearly to lie outside of the application of traditional benefit-cost analysis, the question may be asked whether unique features of the water resource problem make it more susceptible to analysis by this technique. Historically, benefit-cost analysis has been employed primarily by federal agencies that have repeatedly been criticized for overdeveloping projects of regional or local worth. To the extent that these criticisms have been valid, these studies find that the benefit-cost analysis has not sufficiently restrained questionable public investment. The suggested solution in each case is a more rigorous application of benefit-cost analysis and closer adherence to the standards of the private market. Although the analysis and argument of these books are quite persuasive, it is unfortunate that the methods and conclusions cannot be generalized beyond the specific cases considered. The federal agency programs reviewed have a maximum of "tangible" product and a minimum of "intangible" benefit. In different water resource programs "intangible" benefits (satisfactions not readily measured by the market) may contribute importantly to the social and economic justification of public investment. Development of recreational facilities and control of water and air pollution are illustrations of possible federal activities where the benefits are largely intangible.

But the most serious objection to the use of benefit-cost analysis based exclusively upon market judgments is that it adopts an alien and inappropriate standard in the determination of social decisions. A distinguishing characteristic of most governmental functions is that they fall outside the scope of the private economy because the benefits cannot be measured in monetary terms or because the function cannot be undertaken profitably by private enterprise. The primary attribute of market data is that they provide a precise concensus of consumers' preferences, but precision in accounting of benefits and cost cannot be made either the sole or the supreme consideration in public investment decisions. The market can record only a part of the individual's goals and its data are based on the prevailing personal distribution of income. The decisions expressed are of predominantly private (versus public) character and record the contest for gain between producers and consumers rather than provide a guide for social welfare. In short, market decisions are made in a state of ethical vacuity, whereas public policy has meaning only to the extent that it considers the issues that the market ignores.

It is therefore interesting to note that Krutilla and Eckstein abandon the market rate of interest on the ground that it understates the opportunity cost of public investment. Federal agencies, such as the Bureau of Reclamation, have generally used an interest rate lower than that prevailing in the market for benefit-cost studies, but Krutilla and Eckstein contend that the appropriate rate for analysis should be *higher* than the market rate. In other words, the government project should yield a return in tangible benefits that is substantially greater than private enterprise investment in order to justify economically the federal program. Their position is that in times of approximate full employment the cost to the citizen of federal programs is measured by the reduction in private consumption that occurs when resources are diverted from private to public investment. The full magnitude of this cost is not accounted for by the prevailing rate of interest but rather by the higher borrowing rate that confronts those who increase consumption through installment buying and the like. The resort to borrowing is presumed to follow from the increased taxes, reducing consumers' disposable income, that are levied to pay for the federal project.

The consumer's acceptance of the higher borrowing rate is offered as evidence by Krutilla and Eckstein that unless public projects can pay as high a rate, an uneconomic shift of resources from private enterprise to public investment has taken place. Actually this higher consumer borrowing rate indicates only that individuals prefer present consumption to future consumption—irrespective of whether the investment is carried out by private enterprise or public agencies. If the market rate of interest is too low for public projects, then it is also too low for private enterprise—judged only by the installment-buying decisions of some consumers. But public policy cannot be based on such a snippet of information. It may be argued that since private investment increases consumer's goods and services (so of course does public investment) that in subsequent periods the consumer will be "better off" because of increased output. By his acceptance of the higher borrowing rate, however, the consumer has indicated that he desires more consumption now, not later—and the relevance of the consumer's decision is a choice of present consumption over future consumption, not private consumption over public consumption.—L. G. HINES, *Hanover, New Hampshire*.

LAND RESOURCE ECONOMICS. *By* RALEIGH BARLOWE. *Prentice-Hall, Inc., Engelwood Cliffs, N. J. 585 pp., illus., index. 1958. $10.00. (Reviewed by* WILLIAM H. HENEBERRY, *East Lansing, Michigan.)*

This book deals with a wide variety of economic relationships. The reason is that the land economist cannot give proper attention to the economics of land use without considering the interplay of land with the other productive factors. Barlowe pictures the broad scope of the field of land economics as a framework containing three sets of factors which affect man's behavior with respect to land. The physical and biological factors include animal and plant resources as well as the inanimate or mineral resources associated with land. The economic factors involve the effect of the price system on the allocation and distribution of land resources and on the use of these resources for production and consumption. The institutional factors involve the forces of social and collective action in land use. These three sets of factors operate together in actual practice, although they can be analyzed more thoroughly if they are separately considered.

The supply of and demand for land, economic returns to land, property values, development costs, effect of location on land use, property rights, credit, taxation, and land use planning are among the many topics covered in the 18 chapters of this book. A chapter on public measures for directing land use contains precise discussion of the influence of government powers such as eminent domain, police power, taxing and spending powers on land use.

The chapter on conservation of land resources will attract the attention of everyone interested in this subject. Barlowe's definition of conservation as "wise use of resource over time" seems a simple one at first, but it is broad enough to cover man-made improvements such as buildings and dams, as well as biological and mineral land resources. A section on the effect of interest and discount rates helps to explain why some operators find it economic to maintain or build up their soil resources while others can justify gradual depletion of these resources.

Land Resource Economics should prove to be a useful book for professional conservationists. Both students and teachers of land economics will appreciate the diagrams and discussion of input-output relationships affecting land use.

LAND ECONOMICS. *By* ROLAND G. RENNE. *Harper and Brothers, 49 East 33rd St., New York 16, N. Y. 599 pages, illus, index. Revised Edition, 1958. $8.00. (Reviewed by* WILLIAM H. HENEBERRY, *East Lansing, Michigan.)*

The first edition of *Land Economics* appeared in 1947. The revised edition appears to be a better textbook, mainly because of improvements in organization and a greater emphasis on principles of land use. A major improvement of the revised edition is the transfer of a section on land uses to the latter part of the book and replacement of it with a section on land income and land value.

In its new form, *Land Economics* consists of 23 chapters divided into six major parts. Part I delineates the subject matter of land economics, which is conceived as a "distinct, applied field of the parent discipline—economics." A chapter on Land Problems, Policies and Programs outlines the problem areas of land economics, and presents a brief discussion of the objectives and history of land policies in the United States.

Part II covers Principles of Land Utilization. This section includes chapters on the supply of and demand for land, the process of resource allocation, and land conservation. The chapter on land conservation is of special interest to readers of this JOURNAL. Renne has drawn on the writings of well-known agricultural economists to present some of the economic and social factors affecting conservation on the farm and in the community as a whole. A weakness of this chapter is its overemphasis on economic factors in the individual operator's decisions on conservation. The tendency of some farmers to sacrifice present income in order to preserve their soil resources for future generations should have received more attention.

Part III, entitled Land Income and Value, contains chapters on land rent and income distribution, appraisal, credit, and taxation.

Part IV deals with the general area of Property in Land. The institution and development of property rights in land are discussed, as well as the social control of land use, land tenure, and tenancy in both agricultural and non-agricultural land.

Part V covers the Distinctive Features of Major Land Uses. There are chapters on agricultural land, non-agricultural and (forest, recreational, mineral, transportation and urban land) and the relationship between land and water. The statistical material contained in the original edition of this section has been brought up to date or deleted, resulting in a more concise treatment of the subjects involved.

Part VI, on Improvement of Land Use includes a chapter on land-use planning and one on land reform. The latter is a new addition to the book and it covers an important area, although some of the material is repeated from the chapter on farm tenancy.

— SCSA —

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Literature Briefs

Conserving Soil in Alaska—the 49th State. Alaska Soil Conservation Board, P. O. Box 48, Fairbanks, Alaska.

Illustrated report of progress made in the Alaska Soil Conservation District, 1948 to 1958. Soil surveys have been completed on about 2 million acres, of which approximately 42 per cent is considered suitable for tillage.

Soils of Virginia. Agricultural Extension Bulletin 203. 1958. Virginia Polytechnic Institute, Agricultural Extension Service, Blacksburg, Virginia.

Soil Conditions that Influence Wind Erosion. By W. S. Chepil. 1958. USDA Tech. Bul. 1185. U. S. Govt. Printing Office, Washington 25, D. C.

Mulch Tillage: Its Use in the Eastern U. S. Series of statements by agronomists from nine eastern states in the February, 1958, *Crops and Soils*, 2702 Monroe St., Madison 5, Wis. (Single copies 35c)

Forest Rehabilitation and Soil Conservation in China. By Jean Messines. *Unasylva* 12, 3: 103-20. 1958. (Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y. 65c a copy.)

Messines was a member of a French Economic and Technical Mission to China in 1957. Along with his own observations he has drawn freely on information supplied by Chinese experts in presenting a general and valuable picture of some land-use problems in China. As is well-known, population pressures are considerable in China, with an estimated 12 million more Chinese babies each year. (Although not discussed by Messine, it is notable that, according to recent news releases, China has sent about 2 million of its peoples to Tibet.) Much of the work on forestry (particularly) and soil conservation problems is accomplished through use of "cooperative" labor; wherein, according to Messine, "the problem of wages does not arise." However, rises in wages of industry workers have led to similar rises in agriculture.

Engineering Handbook for Soil Conservationists in the Cornbelt. USDA, SCS. 310 pp., illus. (Supt. of Documents, Govt. Printing Office, Washington 25, D. C. $1.75).

According to a Printing Office release, "This handbook has been prepared for soil conservationists and other agricultural workers who have had little or no training in the field of engineering. Efforts have been directed toward supplying engineering information that they can readily use in developing conservation measures for farmland."

Index of Surface Water Records of Texas, 1882-1957. Texas Board of Water Engineers, Bull. 5807-B (copy available on request to the Board, 1410 Lavaca St., Austin, Texas).

Basic data are given on streams and reservoirs, and show graphically the periods for which records of streamflow, stage, chemical quality, temperature, sediment load, and reservoir content are available.

Federal Reclamation Laws, Annotated, Vol. 1, Mar. 2, 1861-Aug. 14, 1946. U. S. Printing Office, Washington 25, D. C. 1950. 927 pp. $3.50.

A chronological compilation of public statutes of the United States enacted through the 79th Congress.

Physical Behavior and Geologic Control of Radon in Mountain Streams. (Can be purchased from Govt. Printing Office, Washington 25, D. C.) 24 pp., illus., map in pocket. 1958. 40c.

Describes use of radon measurements in streams of Wasatch Mountains in locating groundwater increments; factors influencing radon dissipation; and stratigraphic relation of radon concentrations.

Climatology and Microclimatology. Proceedings of the Canberra Symposium. Arid Zone Research XI. 1958. UNESCO, United Nations publication. Can be obtained from Columbia University Press, 2960 Broadway, New York 27, N. Y. $11.00.

The Australian Battle with Evaporation. By John Grinrod. *Irrigation Engineering and Maintenance*, March, 1959, pp. 12, 23. (Single copy, 40c. H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.)

Additional information on the use of hexadecanol for control of evaporation.

Effect of Time of Cutting on Yield and Botanical Composition of Prairie Hay in Southeastern Nebraska. Research Bulletin No. 184. By E. C. Conrad and V. H. Arthaud. 1957. Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

Sagebrush is Going. By Arthur H. Carhart. *Colorado Outdoors* Vol. 8, No. 2, March-April, 1959, pp. 23-27. (Colorado Dept. of Game & Fish, 1530 Sherman St., Denver 1, Colo. Single copy, 25c.)

Carhart questions the advisability of converting sagebrush lands to grass, and advocates more understanding of the ecology and economics of sagebrush lands before making widespread changes.

The Status of Federal Land Grant Lands in Utah and Proposals for Their Management. By Arthur Dwight Smith. 173 pp., 1957. [From Dissertation Abstracts 18(4)]. Dissertation Abstracts, University of Michigan, Ann Arbor, Michigan.

From 7.5 million acres in 1896, public lands in Utah have decreased 3 million acres, with another million acres available when the remainder of the state is surveyed. Significant deterioration of the range has attended years of grazing. Lands that remain are chiefly important for public values of water conservation and recreation. Lack of state land policy and organizations are considered largely responsible for deterioration of the land. A new land policy is proposed, based on adoption of a philosophy of use of lands in the public interest. To help implement such a policy, public lands are here zoned on the basis of recreation, hunting, and water production, and maps are given to show best uses of lands. A plan of organization of a Land

Forestry Commission is outlined. The Commission would have divisions of lands, forestry, minerals, and parks. "The latter one is new, no organization in Utah at present being charged with planning for the recreational needs of the state."—L. F. STICKEL, *Wildlife Review*.

Community Education: Principles and Practices from World-wide Experience. Edited by Christian O. Arndt. 58th Yearbook of the Natl. Soc. for the Study of Education, Part I. 420 pp., 1959. Distributed by the University of Chicago Press, Chicago, Ill. $4, cloth; $3.25, paper.

Americans are now engaged in many forms of cooperation with many foreign countries. This book has much to offer to those engaged in education or teaching introduced techniques to help people to learn how to help themselves. Chapter X, "Community Education in Southern Illinois," by Richard W. Poston contains some valuable sociological lessons. Along similar lines, pages 944-58 of **Man's Role in Changing the Face of the Earth** is illuminating. (Reviewed in the March 1959 JOURNAL.) Obviously such books as *Community Education* and *Man's Role* are valuable background reading for those interested in promoting conservation and social progress.

The Land Where We Live. By Harlan B. Brumsted. Reprinted from *New York State Conservationist*, December-January, 1958-59. 4 pp., center pages contain a graphic presentation in color of good use (36 examples) and misuse (28 examples) of land and water and related resources. Single copies free; write N. Y. Conservation Department, Albany 1, N. Y. Ask for Educational Leaflet L-27, The Land Where We Live.

Brumsted is a member of SCSA, active in the Empire State Chapter, and associate professor of conservation at Cornell University. This leaflet with text and art work should receive wide use, especially in various educational efforts, schools and camps. Undoubtedly bulk orders can be arranged.

The Presentation of Technical Information. By Reginald O. Kapp. 147 pp., index. 1948. (First published in the U. S. in 1957). The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. $2.95.

Although this publication was prepared by a Britisher, it offers a concise usable guide for writers of technical material anywhere. It has received high praise from American teachers and users.

Conservation of Natural Resources. (Vol. 7 of *Living Together in the Modern World*—8 vols.) Edited by Etta S. Ress. Size of vol. 8½ x 11 inches, 114 plates, index. 1954. Published by Creative Educational Society, Mankato, Minn. Set of 8 vols. priced at $39.75.

This is a picture and prose book, with plate and text on opposing pages. Such books have versatility of use by students and teachers. Often interesting and useful exhibits and projects can be built around individual plates and text. The publisher has also issued the excellent 5-volume set entitled, **The Community of Living Things,** which is comparable in format and design to the above book. These books seem to have best use in grades 3 through 7.

Improve Your Writing. (Can be purchased from Govt. Printing Office, Washington 25, D. C.) 28 pp., 1959. 15c.

Prepared to help Army writers recognize and use a modern, more effective style of writing. It deals with attitudes, methods, and techniques, rather than with rules of grammar and composition.

— SCSA —

CONVENTION PAPER REPRINTED

The paper, *Resource Conservation for Recreation and Wildlife Needs,* given by Sigurd F. Olson at the Asheville meeting of the SCSA, has been published in the April, 1959 (Vol. 19, No. 3), *Sport Review Fishing.* The article is well-illustrated, makes good reading, and a proper credit line is given to the Soil Conservation Society of America. (Single copy 50c, Sport Review Publishing Co., P. O. Box 479-L, Mound, Minnesota.)

— SCSA —

Fisheries as a Profession, an eight-page folder in color, has just been released by American Fisheries Society. This is the first and only publication specifically covering employment in the fisheries field. Copies are available (under ten) from the Secretary of the Society, E. A. Seaman, P. O. Box 429, McLean, Virginia. Copies over ten are available at cost, plus postage.

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Explaining uses and benefits of hydrologic data programs . . .

Water Facts for the Nation's Future

WALTER G. LANGBEIN, U. S. Geological Survey; and **WILLIAM G. HOYT,** formerly U. S. Department of the Interior

NEW! This timely book offers an authoritative survey of existing federal and state hydrologic programs for collecting, interpreting, and publishing water data. Giving practical recommendations for future expansion and improvement, it outlines specific steps which must be taken if these programs are to furnish the information indispensable for intelligent management of our water resources. Many original suggestions are presented, particularly for improving the design of hydrologic networks. Based on the authors' extensive experience and data work in special fields from many technical and professional societies. *A Conservation Foundation Study. 41 ills., tables; 260 pp.* $5

The Law of Water Allocation
—In the Eastern United States

Edited by **DAVID HABER,** Rutgers University Law School; and **STEPHEN W. BERGEN,** The Conservation Foundation

Water laws in three eastern states analyzed in the light of western water-law experience. Book discusses the constitutionality of proposed legislation, legislative alternatives, needed research; evaluates water law and economic analysis for state water planning, allocation, use, and development. *Edited for the Conservation Foundation. 12 Contributors; 52 Discussion Participants, Observers. 643 pp. Paper Cover.* $7.50

America's Natural Resources

Edited by a Committee headed by **CHARLES H. CALLISON,** National Wildlife Federation

A factual survey of America's natural resources, their interdependence and conservation. In separate chapters, experts treat each resource, its historical background, and importance to man. They point out dangers to each resource, show how it can be preserved and used most profitably. *"Excellent."*—**Scientific Monthly.** *Edited for the Natural Resources Council of America.* $4

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News Notes

Secretary's Column

MEMBERSHIP in SCSA continues in a healthy position. (See quota table prepared in cooperation with George Winchester, chairman of the membership committee.)

Members who have not paid their 1959 dues will be missing this issue of the JOURNAL until the dues are received at the Society office.

Austin L. Patrick, a past president, was asked to discuss before the Council, at its recent meeting, the matter of the Society keeping in touch with retired individuals who were formerly active in the soil conservation movement.

Dr. Patrick stated that these men were still valuable to the movement and to the Society. Many of them desire to keep in touch with the latest developments and should be encouraged to maintain membership in the Society and participate in chapter affairs.

Chapters are encouraged to assign these men to committees or work in line with their capabilities and interest.

Dr. Patrick also mentioned that many of the agencies, including the Soil Conservation Service for which he works, were taking steps to maintain contact with such individuals.

Record System Changed

The record system of the Society has been under change during the past few months. The alphabetical system that has been used had an upper limit of 10,000 members without purchasing new equipment.

Systems used by other societies were studied. The method used by the Society of American Foresters, which makes use of the addressograph plates for a record system, was adopted.

To make the change a graphotype was purchased last November. With the rush of year-end payment of dues and the change of system we found it not practical to list membership number or charter classification on the membership cards. Next year, if we get time during the summer, these items will be included on the address plates. Several members have written or inquired about this, thinking there may have been an oversight. We are glad to know you value your membership and we are taking steps to offer better and more efficient service. Your forbearance with us during the change will be appreciated.

Annual Convention Progress

H. G. Bobst, chairman of the annual meeting program committee, outlined for the Council the suggestions he has received. The theme, "Commemorating Soil and Water Conservation Progress," was adopted. This theme will blend with the introduction of the special soil conservation commemorative postage stamp on August 26. Also, 30 years ago the U. S. first appropriated special funds for the "soil and moisture conservation" work.

In early May each member will receive additional information about the Rapid City meeting including the names of many of the speakers. In the meantime I suggest that each of you make reservations in accordance with the outline in the March JOURNAL. When you receive a confirmed room reservation, you will be asked for a deposit. It is a busy time for Rapid City; by making reservations early you will not be disappointed. (See form on page 137.)

—H. WAYNE PRITCHARD.

To The Editor:

We have not, we feel, received too much of a response to our ad in the Journal of Soil and Water Conservation. To date we have received only 36 inquiries directly traceable to the ad (the street number is coded in our ads so we know which publication the address was received from).

We realize, of course, that the professional soil conservationists might very well make a mental note of the product's existence without taking the trouble to drop a card for more information. . . . Perhaps an editorial paragraph reminding the Society members that success of advertising depends upon response from them—that if advertisers do not get a reasonable show of reader interest, they certainly are not going to spend their money with continued advertising.

[Name of company withheld]

[EDITOR'S NOTE: Responses to each advertisement from several hundred JOURNAL readers will assure advertisers that their copy is receiving good notice. Such response is of great value in obtaining advertisements which help in defraying publication costs of the JOURNAL.]

MEMBERSHIP QUOTAS

Each year the Membership Committee has established certain goals for the states, Canada and other areas covered by the Society. Although some difficulties are encountered in making up quotas in states with more than one chapter, the results have been good.

	Quota	New Members To March 31	To Go
Alabama	50	22	28
Arizona	30	2	28
Arkansas	30	1	29
California	50	47	3
Colorado	30	3	27
Connecticut	10	2	8
Delaware	10	0	10
Florida	50	6	44
Georgia	30	29	1
Idaho	50	2	48
Indiana	45	19	26
Illinois	60	18	42
Iowa	70	28	42
Kansas	70	31	39
Kentucky	50	13	37
Louisiana	50	17	33
Maine	10	4	6
Maryland	50	9	41
Massachusetts	15	0	15
Michigan	50	5	45
Minnesota	40	10	30
Mississippi	50	16	34
Missouri	30	7	23
Montana	20	1	19
Nevada	10	0	10
New Hampshire	15	4	11
New Jersey	50	8	42
New Mexico	20	17	3
New York	75	10	65
North Carolina	50	22	28
North Dakota	60	11	49
Ohio	100	17	83
Oklahoma	50	10	40
Oregon	50	21	29
Pennsylvania	75	10	65
Rhode Island	10	3	7
South Carolina	50	10	40
South Dakota	**100**	**123**	**+23**
Tennessee	30	14	16
Texas	200	6	194
Utah	20	7	13
Vermont	10	1	9
Virginia	50	8	42
Washington	50	17	33
West Virginia	50	2	48
Wisconsin	50	19	31
Wyoming	20	4	16
Dist. of Col.	50	13	37
Puerto Rico	20	3	17
Canada	100	16	84
Foreign	150	32	128
Students		24	
TOTALS	2525	752	1773

SCSA BECOMES INTERNATIONAL SOCIETY

In the recent elections held in Canada, Norval R. Richards was selected to represent Canada on the SCSA Council. Councilman Richards attended the SCSA Council meetings held in Washington, D. C., March 17 and 18.

N. R. Richards

A native of Bruce County, Ontario, Richards received his B.S. from the University of Toronto and his M.S. from Michigan State University.

From the time of his graduation until 1951 he held a position of Senior Pedologist with the Canada Department of Agriculture, Central Experimental Farms Service, Ottawa, and was actively engaged in soil surveys in Ontario. In 1951 he was appointed Professor and Head, Department of Soils, at the Ontario Agricultural College, Guelph, the position he now holds.

He has made many worthy contributions to the art and science of soil survey having been on numerous planning and organization committees and the author of many soil survey reports. Under his direction the graduate and soil research programs have developed and broadened in Ontario.

Professor Richards joined the Soil Conservation Society of America shortly after its organization; he is a past president of the Canadian Soil Science Society; he is a vice-chairman on Commission II (Soil Chemistry), and Canadian representative to the International Soil Science Congress, and vice-chairman of the Conservation Council of Ontario.

FELLOWS AND HONORARY MEMBER NOMINATIONS

Nominations for the degree of Fellow and Honorary Member are now open. Such nominations must reach the committee or the Society by May 29 to be considered for award at the 1959 meeting of the Society.

A complete guide for determining the qualifications for these honors is available from the Society office. The procedure is also outlined in the by-laws. In addition to the qualifications of the individual, which are considered, the nomination must be signed by 25 qualified members.

The *Fellow degree* is for the professional man engaged in practicing soil and water conservation, or carrying on research in the field of soil and water conservation science, or participating in the administration of these activities. He should have made a broad contribution to the movement and to the Society.

Honorary membership is given each year to a limited number of outstanding individuals who have materially stimulated interest in the field of soil and water conservation.

Your chapter officials have additional information about the nomination procedure. If you desire you may contact the executive secretary of the Society.

Members of the Society who have previously been elected to the Fellow degree include:

Thomas L. Ayers
R. Y. Bailey
Arnold J. Baur
Firman E. Bear
Arthur B. Beaumont
H. H. Bennett
George M. Browning
T. S. Buie
Stanley A. Cain
John H. Christ
Frank L. Duley
J. C. Dykes
Frank C. Edminster
Walter D. Ellison
William J. Endersbee
Evan L. Flory
Morris E. Fonda
Glenn L. Fuller
Edward H. Graham
Walter C. Gumbel
Lloyd L. Harrold
Alfred M. Hedge
Russell G. Hill
Roy D. Hockensmith
John Lamb, Jr.
W. C. Lowdermilk
Cyril Luker
Richard E. McArdle
Arthur C. McIntyre
A. E. McClymonds
Paul C. McGrew
O. M. McConkey
Frank H. Mendell
Edward N. Munns
Ralph H. Musser *(deceased)*
Alexander Nunn
Lloyd E. Partain
Austin L. Patrick
J. H. Price
Harold M. Rhodes
W. A. Rockie
J. S. Russell
E. C. Sackrider *(deceased)*
E. L. Sauer
D. Harper Simms
Fred J. Sykes
R. I. Throckmorton
J. K. Vessey
William Vogt
Ernest D. Walker
Alvin C. Watson
Donald A. Williams
Chester S. Wilson
Fred A. Wirt *(deceased)*

Honorary Members previously elected include:

H. Carl Anderson
Howard F. Barrows
William A. Benitt
R. K. Bliss
A. G. Brown *(deceased)*
Bryce C. Browning
H. D. Byrd
Noble Clark
Nelson R. Crow
Waters S. Davis *(deceased)*
J. B. Douthit
Herbert B. Eagon
Nolen J. Fuqua
Ira N. Gabrielson
Cecil Hagan
Malcolm M. Hargraves
George R. Heidrich
George J. Hildner
Clifford R. Hope
Walter R. Humphrey
Ben F. Jensen
W. H. Kircher
Kent Leavitt
W. W. McLaughlin
V. C. Marshall
Howard S. Miller
Herschel D. Newsom
J. E. Noll
Alfred M. O'Neal
Ervin L. Peterson
George L. Peterson
C. E. Ramser
Robert L. Rutter *(deceased)*
Arthur C. Spurr
D. L. Strathearn
E. H. Taylor
T. W. Thornhill
Augustus Threlkeld
Emil Troug
Robert S. Wilson
J. L. Whitten

DEVELOPMENT FUND BOARD

The recent change in the bylaws of the Society makes provisions for the establishment of a development fund. Previous to this change, only the interest from undesignated funds could be used for such projects, thus making it difficult to secure funds.

The development fund will be administered by a board of trustees subject to the general authority of the Council.

Suggestions have been made that the board shall:

1. Outline worthwhile projects in conservation to the end that the Society may serve the cause of conservation more effectively.

2. Inquire into the special interests of the members of SCSA and determine the extent to which they are willing to provide financial support for the projects along these lines of interest.

3. Inquire into the special interests of people of means and of foundations and other organizations and in developing projects.

4. Develop methods of soliciting and obtaining contributions toward all of these projects.

5. Administer all funds received in support of the Society's development fund projects.

At the March, 1959, meeting of the Council the following men were named to the board: Firman E. Bear, New Brunswick, New Jersey; Russell G. Hill, East Lansing, Michigan; E. H. Taylor, Swarthmore, Pennsylvania; J. S. Russell, Des Moines, Iowa. In addition another man from industry will be named.

H. F. Barrows, as treasurer of the Society, will serve as treasurer of the board and H. Wayne Pritchard, executive secretary SCSA, will serve as secretary of the board.

The first meeting of the board will be held in Washington, D. C., on May 27.

A complete outline of the functions of the board appears in the Society bylaws.

Members of the Society are encouraged to offer suggestions for projects to be considered by the board in time for discussion at the May 27 meeting. Send suggestions to the Executive Secretary, SCSA, 838 Fifth Avenue, Des Moines 14, Iowa.

For the information of members who may be interested in Society projects to be developed under this fund, the Society is a non-profit corporation exempt under section 501(c)(3) of the Internal Revenue Code of 1954. This means that contributions up to the maximum per individual are tax deductible.

Annual Audit Reported by Treasurer Barrows

THE ANNUAL AUDIT of the Soil Conservation Society of America, Inc., business transactions has been completed by Peat, Marwick, Mitchell & Co. for 1958. They are certified public accountants employed to audit financial transactions of the Society and have offices in the Hubbell Building, Des Moines, Iowa.

The report of the audit follows:

Council February 25, 1959
Soil Conservation Society
of America, Incorporated:

We have examined the statements of operating transactions of the treasurer's and executive secretary's accounts, and the reserve account of the Soil Conservation Society of America, Incorporated, for the year ended December 31, 1958. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statements of operating transactions present fairly the recorded cash transactions of the treasurer's and executive secretary's accounts, and the reserve account of the Soil Conservation Society of America, Incorporated, for the year ended December 31, 1958, and the cash and bond (at cost) balances at December 31, 1958.

PEAT, MARWICK,
MITCHELL & CO.
Certified Public Accountants
Hubbell Building
Des Moines 9, Iowa

Exhibit "A"

Soil Conservation Society of America, Incorporated

Statement of Operating Transactions Treasurer's and Executive Secretary's Accounts

Year Ended December 31, 1958

OPERATING RECEIPTS:		
Membership Dues:—		
1957 and Prior	$ 435.50	
1958	28,461.25	
1959	8,791.83	
Student	74.00	
Chapter Dues	651.50	
	$38,414.08	
Less—Chapter Dues Collected and Refunded	717.00	$37,697.08
Journal—		
Advertising	$ 7,069.05	
Sales and Reprints	1,763.34	8,832.39
Booklet Sales—		
"Story of Land"	$ 3,516.99	
"Down the River"	1,164.67	
"Land Utilization"	493.24	
"Our Watershed Resource"	676.75	
"Wonder of Water"	20,402.53	
Miscellaneous	480.00	
Glossary Sales	67.00	26,801.18
Other Receipts—		
Annual Meeting	$ 7,695.75	
Miscellaneous	222.48	
Chapter Income	775.35	
Emblem Articles	536.01	
Interest on Bonds	375.00	
Teachers' Guides	81.85	
Development Fund	24.00	9,710.44
Total Operating Receipts		$83,041.09
OPERATING EXPENDITURES—		
Exhibit "A-1"		84,516.33
Net Operating (Loss)		1,475.24
ADD:		
Cash Balances at January 1, 1958—		
Treasurer's Account	$12,332.49	
Executive Secretary's Account	447.07	$12,779.56
Less—Net Transfers to Reserve Account	4,510.98	8,268.58
CASH BALANCES— DECEMBER 31, 1958:		
Treasurer's Account	$ 6,221.59	
Executive Secretary's Account	571.75	$ 6,793.34

Exhibit "A-1"

Statement of Operating Expenditures Year Ended December 31, 1958

OPERATING EXPENDITURES:		
Executive Secretary's Office—		
Salaries	$16,896.78	
Society's Share of Payroll Taxes	385.46	
Society's Share of Executive Secretary's Life Insurance	307.02	
Executive Secretary's Travel	2,077.67	
Equipment	2,167.32	
Office Supplies	5,154.14	
Rent and Utilities	2,346.38	
Insurance	215.48	$29,550.25
Journal—		
Editor	$ 7,012.96	
Editor's Travel	826.12	
Printing	14,359.51	
Reprints	1,308.09	
Advertising Space Representation	450.71	23,957.39
Booklets—		
"Story of Land"	$ 2,386.13	
"Wonder of Water"	11,542.36	
"Watershed"	570.93	
"Land Utilization"	570.00	
Miscellaneous	238.81	15,308.23
Postage		$ 3,207.50
Council Expenses		1,963.23
Committee Expenses		280.60
Book Sale Credit to Chapters		1,569.75
Freight and Express		304.69
Emblem Expense		1,037.58
Annual Meeting		6,814.62
Auditing		185.00
Membership Refunds		35.00
Miscellaneous		302.49
Total Operating Expenditures		$84,516.33

Exhibit "B"

Statement of Operating Transactions Reserve Account

Year Ended December 31, 1958

	Total	*Savings Account*	*United States Treasury Bonds Series "G" At Cost*
BALANCE— January 1, 1958	$18,540.77	$3,540.77	$15,000.00
ADD:			
Interest accrued by bank	175.05	175.05	—
Net transfers from treasurer's account	4,510.98	4,510.98	—
	4,686.03	4,686.03	—
BALANCE— December 31, 1958	$23,226.80	$8,226.80	$15,000.00

Exhibit "C"

Schedule of United States Treasury Bonds

December 31, 1958

	Issuing Date	*Series "G" Serial No.*	*Cost*
Soil Conservation Society of America, Incorporated	5-47	D3-413413G	$ 500.00
	5-47	M7-609157G	1,000.00
	5-47	M7-609158G	1,000.00
	2-48	M7-609159G	1,000.00
	2-48	M7-609160G	1,000.00
	4-49	M7-609161G	1,000.00
	4-49	M7-609162G	1,000.00
	8-50	M7-455615G	1,000.00
	8-50	M7-455616G	1,000.00
	1-51	M7-736364G	1,000.00
	1-51	M7-736365G	1,000.00
	2-51	M7-738012G	1,000.00
	2-51	M7-738013G	1,000.00
	7-51	M7-788217G	1,000.00
	7-51	D3-486001G	500.00
	2-52	M8-239007G	1,000.00
			$15,000.00

Net Worth

The audit by Peat, Marwick, Mitchell & Co. included only the cash transactions. The following net worth statement, including inventories, was prepared by the Executive Secretary. The net worth statement does not include any dues receivable for 1959.

Net Worth Statement

December 31, 1958

ASSETS:		
Cash (Treasurer's Account)		$ 6,221.59
Cash (Executive Secretary's Account)		571.75
Savings Account		8,226.80*
Treasury Bonds		15,000.00
Supplies		4,591.79
Equipment		6,218.11
Accounts Receivable		1,150.38
Deposit with United Airlines		425.00
Total Assets		$42,405.42
LIABILITIES:		
Accounts Payable	$ 2,328.05	
Chapter Dues Refundable	96.50	
Chapter Booklet Commissions Payable	711.66	
Last Quarter Withholding Tax Payable	364.70	
	$ 3,500.91	
Net Worth—December 31, 1958	$38,904.51	
December 31, 1957	$40,134.35	
Decrease in Net Worth in 1958	$ 1,230.34	
1957 Increase in Net Worth	$ 4,775.26	
1956 Increase in Net Worth	$ 69.36	
1955 Increase in Net Worth	$10,408.33	

*Of the $8,226.80 in the savings account, $2,895.00 is from sustaining memberships and $280 is for equipment reserve. During the year $3,430.98 was returned to the savings account replacing that borrowed to start *The Story of Land* project. Bank interest amounted to $175.05 and bond interest to $375.00 during the year.

Explanation

The Society receipts for 1958 totaled $83,041.09 for the largest income of any year. With an expanded program the expenditures were $84,516.33 which left a cash operating deficit of $1,475.24. Because of a convention that was later than usual and a change in the accounting system, the collection of 1959 dues in December was about $6,000 less than a year ago. Thus the deficit will undoubtedly be gained in the early part of 1959.

Sales of *The Wonder of Water* amounted to $20,402.53. This was the first year for this publication. Total sales of Society booklets amounted to $26,801.18 as compared to $14,673.81 in 1957.

Advertising income in the JOURNAL OF SOIL AND WATER CONSERVATION continued to decrease with an income of $7,069.05 in 1958 as compared to $8,152.23 in 1957 and $9,194.22 in 1956.

HOWARD F. BARROWS, *Treasurer*

Wild Game Feed
— Feature of SCSA 1959 Convention

Worth Growing About!
Worth Knowing About!

SCSA ANNUAL CONVENTION
AUG. 26-28
RAPID CITY • SOUTH DAKOTA

MEMBERS of the Soil Conservation Society of America attending the annual convention at Rapid City, South Dakota, in 1959, will have their palates treated to an array of dishes, prepared of wildlife from that State.

South Dakota Chapter members, with the cooperation of the South Dakota Game, Fish, and Parks Department, have been gathering pheasants, ducks and deer for a Game Room dinner at the national meeting in August, 1959.

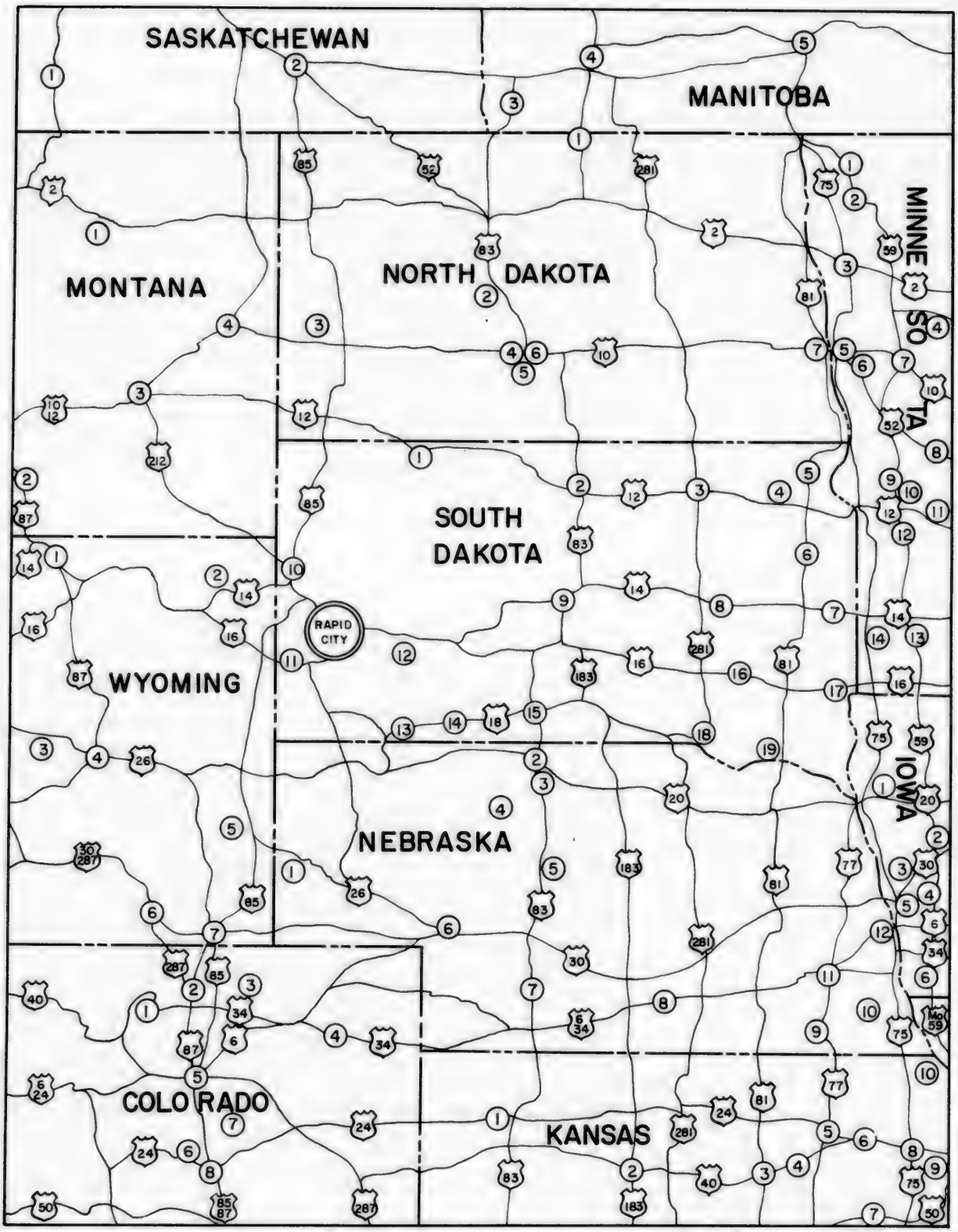
One of the highlights of the preparations was on November 22, 1958, when 28 employees of the Soil Conservation Service in South Dakota took part in a pheasant hunt to supply a portion of the game.

Under the direction of E. J. Daniel, State Soil Conservationist for SCS, the group set out in three hunting parties. Although the pheasants were reluctant to cooperate, 63 birds went into the deep freeze to await the meeting. Additional hunts by this group bagged a total of eighty ringnecks. Small hunts by other groups and individuals added more birds. Over 250 pheasants, the pride of South Dakota, are ready.

At the Game Room snack bar Society members will sample other products of South Dakota's bountiful wildlife range—antelope and buffalo will also grace the tables to tempt the appetite of wildlife epicures.—LEROY A. SHEARER, *Huron, South Dakota.*

Personnel from the SCS State Office in South Dakota cleaning pheasants that will be prepared for the Game Room snack bar—a feature of the SCSA 1959 convention. Ross Davies, state conservationist, *lower right hand corner)* is hard at work in this willing crew.

E. J. Daniels *(above, right)* state soil conservationist in South Dakota, gives final instructions to SCS state office nimrods prior to start of a pheasant hunt. The men are warned that the prehistoric monsters *(left)* in Dinosaur Park (Rapid City) are not legal game. Stegosaurus will not be served.



SOME POINTS OF INTEREST

TO HELP YOU PLAN YOUR CONFERENCE TRIP

This map and legend have been prepared by the local arrangement committee of the 14th Annual Soil Conservation Society of America Convention. Use it in planning your trip to Rapid City. The numbers below refer to the "circled" numbers within the several states and Canada on the map.

SOUTH DAKOTA

Rapid City—where the SCSA will meet, might be called "air conditioned." Summers are cool; winters moderate, even warm when the chinook winds sweep over the nearby hills. Average rainfall is 17½ inches, and the humidity is low. The city is 3,230 feet above sea level. It is second largest city in the state in population (40,000) and largest in area, and is the county seat of Pennington County. As a tourist center and a military base it has the most capabilities for housing of any city in the nation of comparable size. South Dakota School of Mines and Technology is located here.

Places to go and things to do: Black Hills Range Days Horse Show, Black Hills Exposition, Dinosaur Park and Skyline Drive, Ellsworth Air Force Base, Sioux Indian Museum, State Fish Hatchery at Canyon Lake, Rim Rock Drive, Sioux Sanatorium, South Dakota National Guard Headquarters, South Dakota School of Mines and Museum, flour and lumber mills, cattle sales rings, dog racing track, amusement park.

1. **Lemon.** Petrified Wood Park. Shadehill Reservoir.
2. **Mobridge.** On the bank of the Missouri River. Chief Sitting Bull's grave.
3. **Aberdeen.** Sand Lake Refuge, northeast of Aberdeen, is operated by the U. S. Fish and Wildlife Service. Known for its excellent flights of Canada, Blue, and Snow geese and a large resident goose flock.
4. **Waubay.** Waubay Refuge, a favorite spot for birders, lies just north of town on Highway 12. Many species of waterfowl and shorebirds may be observed here in the heart of the prairie lake region. Excellent fishing. Waubay is Indian for "place for birds."
5. **Sisseton.** Ft. Sisseton, the oldest remaining fort between the Rockies and the Great Lakes, was constructed by the Army following the Sioux uprisings and massacres in Minnesota in the early 1860's. Now a state park located in the heart of the Lake Region.
6. **Watertown.** Lake city of the Dakotas, lies next to Lake Kampeska (5,500 acres). Excellent fishing, boating and picnic areas. The heart of the state's seed-potato producing area. Northwest of the city is the state's large conifer tree nursery. Directly north on Highway 81 is the Northeast Agronomy Farm where extensive crop variety testing programs are carried out by South Dakota State College.
7. **Brookings.** South Dakota State College.
8. **Huron.** The ringnecked pheasant, state bird of South Dakota and trademark of the Sunshine State, abounds by the millions throughout most of the state. Best time to see the most ringnecks is early morning and late afternoon but use caution when approaching flocks along the highways. Huron, the axis city of the pheasant range, is also host of the annual State Fair, the first week in September.
9. **Pierre.** The capital city, contrasts the open range and rich Indian lore with modern hydroelectric, flood prevention and irrigation programs of Oahe Dam, just north of the city. Oahe, the second largest compacted earthen dam in the world, lies just upriver from Pierre, near the site of old Ft. Sully and historic Indian encampments. Farm Island downstream is an attractive state park and was a campground for Lewis and Clark on their explorations. It lies close to the site of fur trading posts of the early 1800's.
10. **Belle Fourche.** The No. 1 "dam town" because of the Belle Fourche Dam. Orman Reservoir, 10 miles long and approximately two miles wide, was created by the earthen dam 6,300 feet long and 115 feet high; said to be the largest of its kind in the world when built in 1905. The canal, which brings water from a diversion dam on the Belle Fourche River, is 6.5 miles long. Here is the center of an irrigated county. The reservoir has many walleyed and northern pike and catfish.
11. **Black Hills National Forest.** Covering most of the Black Hills area, this forest of pine and spruce has one of the most rapid rate of reproduction of all the national forests. The forest adds incomparable beauty to the many other interesting features.

    Custer State Park. Beautiful, unspoiled mountain scenery in this large 128,000 acre playground. Five crystal-clear lakes, bubbling mountain streams, deer, elk, mountain goats and the largest free-ranging herd of buffalo in North America. Free museum, Doll House and Zoo. Black Hills Playhouse for drama.

    Mount Rushmore. Mount Rushmore, sculptored by Gutzon Borglum, on a mountain 6,000 feet high, carved to the size of men who would be 465 feet tall. Looking closely one can see pine trees already growing in the rubble. An example of the dimensions: Washington's face from hair line to chin is 60 feet, mouth 22 feet wide and a full grown man can stand in his eyes. Imperishable as the granite from which they were shaped, the gigantic busts of Mount Rushmore speak to the ages. Here the fortitude of Washington, the vision of Jefferson, the faith of Lincoln and the vigor of Theodore Roosevelt are enshrined forever . . . a 'must' stop.
12. **Badlands National Monument.** Located east of the Black Hills are the Big Badlands, grotesque and colorful examples of ancient wind and water erosion. Sixty million years ago, the Badlands were the floor of a great salt sea. As the waters receded, steaming marshes emerged, home of the gigantic prehistoric monsters, fierce sabertoothed tigers and lumbering dinosaurs. Today the Badlands are one of the world's most noted fossil beds, explored annually by scientific groups in search of specimens. The Badlands became a National Monument in 1939 and includes 111,529 acres, extending 60 miles long and two to 15 miles wide.
13. **Wounded Knee.** Site of the Battle of Wounded Knee, and cemetery.
14. **Martin.** La Creek Federal Refuge, near Martin, is the third of the large federal refuges in South Dakota. Located in the sandhills region, it affords ornithologists glimpses of birds seen few places elsewhere in the state. Excellent sport fishing.
15. **Mission.** Geological Museum.
16. **Mitchell.** Corn Palace—the entire exterior, and portions of the interior, are covered with colored corn—red, blue, yellow and white, arranged in geometric patterns and outlined with grasses and grains. The Palace is redecorated each year during Indian Summer at a cost of $15,000. This requires between two and three thousand bushels of corn in natural color. The original Corn Palace was constructed in 1892. The present structure was built in 1921. It is approximately one-half block square and seats 5,000 people. An annual festival is held the last week in September.
17. **Sioux Falls.** Largest city in South Dakota and a communications center. The people call their city "The Gateway to the West."
18. **Fort Randall Reservoir** and Fort Randall Dam at Pickstown, near the ruins of Old Fort Randall established in 1856. This lake is part of the Missouri Basin Development plan along with Oahe and others, to prevent floods, regulate the river flow, and provide power, irrigation water, and recreation.
19. **Lewis and Clark Lake.** Gavin's Point Dam near Yankton is another in the Missouri Basin series. The lake provides, in addition to water storage for power and other uses, fishing, boating, camping, and scenery.

COLORADO

1. **Rocky Mountain National Park.** Some 405 square miles of magnificent mountain scenery reached by U. S. Highway 34. A drive over Trail Ridge Road crosses one of the highest passes in the Rockies (12,183 ft.) to reach Granby Reservoir and Shadow Mountain Lake. Units of the Reclamation Bureau transirrigation diversion system that supplies irrigation water to the western slope. Boating, fishing, camping, trail riding, mountaineering, and hiking all through this area.
2. **Fort Collins.** Site of Colorado State University, the U. S. Forest Service Rocky Mountain Range Experiment Station and offices of many government agencies. Of particular interest is a new National Seed Depository. Completed in 1958 the ultra modern building serves as a "bank" to preserve samples of all crops and grasses so they may be available for future plant breeding work. Excellent accommodations, mountain travel, and intensive irrigation.
3. **Briggsdale.** Briggsdale Land Utilization Project (USFS), features reseeding and grazing management activities. Suitable accommodations at Greeley and other nearby towns. Visitors should advise the manager, C. R. Van Doren, by mail as to their expected arrival time. Forest Supervisor is James Wenbau, Fort Collins, Colo.
4. **Akron.** USDA, Central Great Plains Field Station: dryland crops, and soil, and water investigations. Excellent accommodations nearby. Visitors should advise Superintendent Charles E. Johnson of their expected arrival time.
5. **Denver.** Capital of Colorado. Celebrates its 100th year in 1959. Nearby mountain areas include the highest mountain auto road in the world—14,264 feet on the top of Mount Evans. Plenty of motel and hotel accommodations. State Offices of most agricultural departments are located in New Custom House Building. Other government offices, including the Regional Office of the USFS and the laboratory of the Bureau of Reclamation are located at the Denver Federal Center.
6. **Woodland Park.** Manitou Park Forest Experiment Station is twenty miles northwest of Colorado Springs on U.S. 24. Excellent accommodations nearby. Range management and water-shed improvements in a typical Pine and Bunch-grass area.
7. **Kiowa.** Pilot Watershed Project, 40 miles southeast of Denver, 40 miles northeast of Colorado Springs. Site of watershed work evalution by government agencies. Construction now approximately 75 per cent complete. Mixed dryland farming, pine bunch grass—short grass area. Visitors wishing to inspect the area should address Robert Appelman, SCS, Kiowa, Colo.
8. **Colorado Springs.** Gateway to the mountain area. Pikes Peak, elevation 14,100 feet, reached by automobile road or cog railroad. Auto toll 50 cents per person. U. S. Air Force Academy. Visitors may see shaping, reseeding and drainage work along the roads of the Academy.

CANADA

1. Highway leading North to **Swift Current,** Province of Saskatchewan, and the **Dominion Experiment Station,** where research in forage crops and pasture is carried on, along with other types of agricultural research.
2. Highway leading Northwest to **Regina,** the capital of Saskatchewan. The Saskatchewan Department of Agriculture is located at Regina. There, too, ecological experiments (pasture and utilization) are going on.
3. Many single-row pattern windbreaks may be seen in this area.
4. This is one way to go (north) to **Riding Mountain National Park.** This is a large playground for visitors and is also a wildlife sanctuary.
5. **Winnipeg.** Capital of the Province of Manitoba, and starting point for many tourists visiting Manitoba.

IOWA

1. **Little Sioux Flood Prevention Project.** A "show case" demonstration of watershed protection, which began operations in 1946. There are now 136 active sub-watersheds within the project area. Work has been completed on 31 sub-watersheds and work plans have been prepared or are in process for 50 sub-watersheds. During the summer of 1959, 45 sub-watersheds will be under construction. Over 450 flood-prevention structures have been installed. A total of 2,534 miles of standard level and basin terraces have been constructed. For information on air tours from Mapleton, Iowa, and maps showing specific projects along Highways 20 and 141, contact George Lamp, Area Conservationist, SCS, Room 210 Federal Building, Sioux City, Iowa.
2. **Big Park Watershed.** 7,500 acres with construction probably getting underway this fall. A considerable amount of upland treatment has been applied on the gully leading straight south from the town of Dow City on U. S. highway 30, Crawford County.
3. **Harmony Creek Watershed, Logan, Iowa.** 3,100 acres and is Iowa's first completed Public Law 566 Watershed. Located 1½ miles south of Logan, Iowa. Watershed has 100 miles of level terraces and six stabiliza-

tion structures, two of which are located on county roads. Logan is on U. S. highway 30.

4. **Bluffs Horticultural Farm.** On this farm (115 acres) Iowa State College is conducting many horticultural experiments. The trees and grapes are located on terraced land. Location is about 5 miles east of Council Bluffs on Highway 64 and ¼ mile south.
5. **Lime Kiln Hollow Watershed.** Problems in the Ida-Hamburg soil area from the standpoint of steep slopes and excessive gullying, with lime quarry sitting at the base. Turn left at the first gravel road 1¼ miles north of the city limits of Council Bluffs on Alternate U. S. Highway 30.
6. **Malvern, Iowa.** Mule Creek Pilot Watershed Project. Project is now complete.

KANSAS

1. **Colby,** U. S. 24. Old sod house and museum. Kansas State College Branch Experiment Station. Center of wheat producing area.
2. **Hays,** U. S. 40, 183. Fort Hays State College, State Agricultural Experiment Station. Grassland ecology. Old Blockhouse Museum.
3. **Salina,** U. S. 81, 40. State Office of Soil Conservation Service. Largest milling center of the state. Largest Indian burial grounds. Schilling Air Base.
4. **Abilene,** U. S. 40; K 15. Boyhood home of President Eisenhower. Eisenhower Memorial.
5. **Fort Riley.** Military Reservation between Junction City and Manhattan, K 18. First territorial Capital of Kansas, 1857.
6. **Manhattan.** U. S. 24; K 18, 13, 29. Home of Kansas State College, Big Eight Basketball Champions 1958-59. ASC State Office. Tuttle Creek Reservoir 5 miles north on K 13—largest flood control reservoir in Kansas.
7. **Emporia,** U. S. 50; K 99; Kansas Turnpike. Cattle center of the Flint Hills pasture country—the largest natural bluestem grass grazing area remaining in the United States.
8. **Topeka,** U. S. 40, 24, 75; K 4; Kansas Turnpike, State Capital, Historical Society.
9. **Lawrence,** U. S. 24, 40, 59. Home of Kansas University.
10. **Brown County.** Little Delaware Watershed, Hiawatha.

MINNESOTA

1. **Lake Bronson State Park.** Artificial lake (327 acres) created by impounding the South Branch of Two Rivers as part of the Red River Valley water conservation program. Picnicking, lake fishing, hiking, boating, and organized group camping.
2. **Old Mill State Park.** Remains of an old waterpower operated flour mill, constructed in 1888. The original grindstones, which were shipped from France to Fargo, North Dakota, and from there hauled to the site by ox carts, are still in preservation. Hiking, stream fishing, swimming, picnicking, and tourist camps.
3. **Crookston.** This city stands in a broad level valley once filled by glacial Lake Agassiz. It is home of the Northwest School of Agriculture and Experiment Station, a branch of the University of Minnesota. Site of the annual Red River Valley Agricultural Exposition.
4. **Itasca State Park.** This scenic area contains Lake Itasca, the source of the Mississippi River, discovered in 1832 by Henry R. Schoolcraft. Beautiful stands of virgin timber, Indian mounds, and recreation facilities. A state forestry school and biological station is operated by the University of Minnesota for summer school students. There are many resorts and lakes in the surrounding area.
5. **Moorhead.** One of western Minnesota's most important industrial and manufacturing cities, noted for dairy processing plants, sugar beet industry, leading potato center of the Northwest, and manufacturing of many products that depend upon the raw materials of agriculture. Concordia College and Moorhead State College located here.
6. **Buffalo River State Park.** This preserve commemorates the Muscoda townsite and prehistoric Campbell beach of Lake Agassiz.
7. **Detroit Lakes.** The "Riviera" of Minnesota and the capital of the park region—a recreational area honeycombed with more than 400 sparkling lakes in a radius of 25 miles.
8. **Alexandria.** Situated in the heart of one of the state's finest lake regions, popularly known as the Fish Bowl of Minnesota. Many facilities for summer vacations amid surroundings of scenic beauty, which was the main camping ground for many Sioux and Ojibway tribes of American Indians. Its early history goes back to the ox cart trains of the Red River fur traders. Alexandria is also the home of the Kensington Runestone, which tells of the tragic journey of a hardy band of Vikings to the Alexandria area in 1362. The stone is located in the Centennial Museum, which also has wildlife and historical exhibits. Lake Carlos State Park is located 10 miles north.
9. **Morris.** The West Central Agricultural College, a branch of the University of Minnesota, is located at the southeastern boundary of the city. It is one of the state's leading agricultural experiment and weather stations.
10. **Pomme De Terre State Recreationnl Reserve.** Lake created by water conservation dam. Picnicking, swimming and boating.
11. **Shakopee Creek and Mud Creek Watersheds.** Two of the tributaries of the Chippewa River Tributaries and Hawk Creek Watershed Protection Project, the largest of the Pilot Watersheds in the United States. The Shakopee Creek project includes 24 miles of channel improvement and two floodwater retarding structures (7,200 acre-feet of temporary storage for flood protection). Construction is nearly complete. The Mud Creek project includes 13.3 miles of channel improvement and 41.6 miles of floodway, with construction started this summer.
12. **Lac Qui Parle State Park.** The site of the Chippewa-Lac Qui Parle Mission, erected in 1835, at the foot of the lake. This mission (church restored in 1941) had the first church bell in the state and manufactured the first cloth in Minnesota. This park, a part of the Lac Qui Parle flood control project, has picnicking, hiking, boating, and lake and stream fishing.
13. **Lake Shetek State Park.** Lake Shetek monument, located on the east mainland, commemorates the massacre of a white family during the Indian uprising of 1862. Loon Island, a bird sanctuary, is within the park area. Lake fishing, bathing, boating, picnicking, hiking, tourist camping, and organized group camping.
14. **Pipestone National Monument.** Here are located ancient pipestone quarries (found no other place in the world) from which Indians gathered unique reddish stone to make ceremonial pipes. This area was once sacred ground to which Indians came in peace from all over the Great Plains. Nearby is the Pipestone Indian Training School.

MONTANA

1. **Fort Peck Dam and Reservoir.** This dam, 250 feet high and 21,026 feet long, creates a lake 189 miles long and 16 miles wide. The structure is one of a series of structures along the Missouri River. U. S. Highway 2 leading west from the lake is one of the routes to Glacier National Park in northwestern Montana, and Canada.
2. **Custer Battlefield National Monument.** Site of the Battle of Little Big Horn, where in the spring of 1876, General George A. Custer and approximately 250 men of the 7th U. S. Cavalry were massacred by a huge force of Indians. The battlefield is now a cemetery for the soldiers of this and other battles. U. S. Highway 87, leading northwest from the battlefield, is a route to Yellowstone National Park and to western Montana.
3. **Miles City.** Cattle country capital where each year several hundred wild horses are sold at auction. This sale brings cowboys and rodeo fans from all over the country. The city was named after General Nelson A. Miles, who built Fort Keogh there in 1877.
4. **Glendive.** Makoshika State Park. The badlands country with freakish shaped rock formations that during sunny days change from one brilliant color to another. Fossilized remains of prehistoric animals are found in the area. Collections of fossils are on display.

NEBRASKA

1. **Scottsbluff National Monument,** near Scottsbluff on State Highway 29. Historic marker for pioneers.
2. **Niobrara National Game Reserve.** A few miles from Highway 20, near Valentine—longhorn cattle, buffalo, etc.
3. **Valentine Migratory Waterfowl Refuge.** U. S. Highway 83; about 30 miles south of Valentine.
4. **Nebraska Sandhills.** One of the nation's finest natural grazing areas. Highway 2, Broken Bow to Alliance. Highway 20, Ainsworth to Chadron. Read book, *Old Jules* by Mari Sandoz for historical background of Sandhills.
5. **Nebraska National Forest.** On Nebraska Highway 2, near Halsey, National forest plantation made about 50 years ago.
6. **Lake McConaughy and Kingsley Dam.** Ten miles north of Ogallala on Highway 61. Large irrigation and public power reservoir.
7. **Irrigated Agriculture.** Some of Nebraska's 2,000,000 acres of irrigation. From Lincoln west on Highways 6, 34 and 30.
8. **Pioneer Village.** Minden, on Highway 6. An outstanding collection of pioneer homes, buildings, machinery, household furnishings.
9. **Homestead National Monument.** Near Beatrice, and Highway 77, the first homestead in the United States under the National Homestead Law.
10. **Southeast Nebraska**—Highways 2, 34, 77 and 75. One of the great concentrations of conservation land treatment in the U. S. A.
11. **Lincoln.** State Capitol Building, State Historical Museum and Morrill Hall, the University of Nebraska Museum, State Office SCS, Northern Great Plains SCS Field Cartographic Unit, and Engineering and Watershed Planning Unit.
12. **Omaha.** Boys Town—home for boys. Union Stockyards—world's largest livestock market. Joselyn Memorial Art Center.

NORTH DAKOTA

1. **International Peace Garden.** Formal gardens on the border between the United States and Canada nestled in the heart of the beautiful Turtle Mountains. The gardens are dedicated to the perpetuation of peace between the United States and Canada and to an unguarded border.
2. **Garrison Dam and Reservoir.** The largest rolled earth filled dam in the world. It will create a pool 125 miles long when filled and will provide flood control, irrigation, electrical power and recreation. It is now about half filled. This lake is part of the Missouri Basin Development.
3. **North Dakota Badlands.** The colorful deeply eroded valley of the Little Missouri River in western North Dakota. Most famous for the Painted Canyon along Highway 10. *Theodore Roosevelt National Memorial Park,* in the heart of the Badlands, is famous for the burning coal mines, nature trails and beautiful scenery. Has well developed camp site. *Burning Hills Amphitheatre,* the pageant "Old Four Eyes," a drama of Teddy Roosevelt's days in North Dakota. Performances: Wednesday, Thursday, Friday, Saturday and Sunday evenings during July and August. *DeMores Historic Site and Museum,* the palatial residence of a French nobleman who founded the Town of Medora, was a pioneer in cattle ranching during Teddy Roosevelt's era and built a modern meat packing plant.
4. **Northern Great Plains Field Station, Mandan.** The Agricultural Research Service headquarters for the Northern Great Plains area is outstanding for work on field shelterbelts and grasses.
5. **Fort Lincoln.** *Fort Lincoln Nursery*—This well-developed tree and grass nursery is one of two owned and operated by the soil conservation districts of the State. It covers 355 acres and produces several million trees and shrubs annually. *Fort Lincoln State Park*—General Custer's headquarters and a reconstructed Mandan Indian village and museum. The Indian village is overlooked by the rebuilt block houses of Old Fort McKeen.
6. **Bismarck.** *State Capitol Building*—A modern 19 story Capitol and State office building with well kept grounds. One of the most beautiful state capitols in the nation. *Museum of Natural History*—on the grounds of the State Capitol: Indian lore and the early history of the settlement of North Dakota.
7. **North Dakota Agricultural College and Experiment Station.** In the heart of the Red River Valley at Fargo. The Station leads in research on small grains and potatoes.

WYOMING

1. **Sheridan.** Big Horn Mountains and Basin. Scenery, fishing, and historic area. U. S. Highway 14 (west) leads to Yellowstone National Park.
2. **Devil's Tower National Monument.** Rises 1,280 feet from the rolling Black Hills country surrounding it. Prairie dog towns.
3. **Hell's Half Acre.** On the route west to Shoshone Dam. Wind River Canyon, and Grand Teton National Park. Oldest USFS ranger station.
4. **Casper.** One of Wyoming's most modern cities. Casper is also a historic area, and a place for recreation.
5. **Fort Laramie.** Fort Laramie National Monument. Pine Ridge Case Bier Watershed.
6. **Laramie.** University of Wyoming. State Experiment Station, scenery, fishing.
7. **Cheyenne.** Capital of Wyoming. Home of world famous Cheyenne Frontier Days Celebration.

STAMP COLLECTORS ATTENTION

A new commemorative postage stamp is placed on First-Day sale by the Post Office Department through a post office where a special event features the introduction of the stamp.

On August 26 at Rapid City, South Dakota, a four cent (4c) soil conservation commemorative stamp will be introduced.

Postmaster General Arthur E. Summerfield has stated, "This soil conservation stamp should help focus public interest on the extensive soil conservation efforts being made by Federal and State governments, local soil conservation districts, watershed associations and other public and private groups. The issuance of 120 million of these stamps is in further recognition of the stake all our people, urban as well as rural, have in the work of maintaining and improving the nation's vital natural resources of soil, water, forests, and grasslands."

The Soil Conservation Society of America has authorized the Washington Press, Box 991, Newark 1, N. J. to print the "official" first-day cover envelopes. Information about these envelopes is noted in the Washington Press advertisement carried in this issue *(see page 102)*.

First-day of issue stamps will be on sale only in Rapid City on August 26. They will be on sale in other postoffices on the 27th.

If you desire a first-day cover with stamp or stamps, you should submit a legibly return-addressed envelope with remittance to cover the value of postage to be affixed, to the postmaster in Rapid City. The remittance should be in money order; or coins may be sent at your own risk. No checks, stamps, or foreign currency may be sent.

A first-day cover is an envelope bearing the commemorative stamp or stamps that is postmarked on the first day of issue. Because of the special event you may wish to use the official first-day cover authorized by SCSA and obtainable from the Washington Press. Envelopes should measure 3¾ x 6½ inches. Sufficient space must be allowed for the stamp or stamps; so address the envelope you wish returned near the bottom of the cover.

Other rules for securing a first-day cover:

1. Each cover should bear a pencil endorsement in the upper right hand corner to show the number of postage stamps to be affixed thereto—such as 1, 2, or 4.

2. To insure clear postmark impressions and to prevent mutilation in canceling machines, a thin card or folded sheet of blank paper should be placed in each cover and the flap either sealed or tucked inside.

3. The outside envelope you use to send the cover you want cancelled should be endorsed FIRST-DAY COVERS and SOIL CONSERVATION stamp to permit ready identification at Rapid City. Be sure your cover reaches Rapid City before August 26.

4. Your letter of instructions to the postmaster in Rapid City should not include inquiries on other matters, and should be accompanied by the remittance and the covers you wish stamped.

Rutgers Student Chapter (New Jersey) organized and held a session for Society members attending the North American Wildlife Conference March 2-4 in New York City. Students of Rutgers: Ronald Van Pelt, Elden MacNamara, James Barker, and Peter Buell, presented a panel on research and studies they were undertaking at the University. Robert Hanna is faculty adviser to the Rutgers Student Chapter and also spoke at the session. L. G. MacNamara, superintendent of wildlife management in New Jersey, described many of the interrelations of soil, water, and wildlife conservation programs.

Rutgers students at 1958 SCSA convention tape record some programs for use back in New Jersey. Robert Hanna *(upper left)* is faculty advisor to the chapter.

Planning and hard work help make a successful conference. The 1959 convention steering committee in a shirt-sleeve session *(left-right)*: J. Loucks, H. Woodward, P. Skalland, H. Hiller, R. Davies, M. Craig, O. Claflin, D. Moxon, R. Huxtable, and E. Lumb.

APPLICATION FOR HOUSING ACCOMMODATIONS, SCSA CONVENTION, RAPID CITY, SOUTH DAKOTA, AUGUST 26-28, 1959

For your convenience in making hotel or motel reservations for the *Soil Conservation Society of America* Convention to be held in Rapid City, South Dakota on August 26-28, 1959, the necessary information and forms are supplied below.

The HIGH SCHOOL AUDITORIUM has been designated as convention headquarters. There is ample housing available in Rapid City for this convention. One hotel and eighteen (18) motels are within walking distance; the rest are in easy driving distance, within the city limits.

It must be remembered that this convention does come within the tourist season. The reservation committee can fill all requests if received by July 1. Requests received after July 1 will be in competition with the tourist trade.

APPROXIMATE PRICE RANGE FOR ACCOMMODATIONS

	Single	*Double*	*Twin*
HOTEL	$6.00- $9.00	$ 8.00-$10.00	$11.00-$13.00
	Double	*4 or more*	*Kitchen Facilities for 4 to 6*
MOTEL	$6.00-$13.00	$10.00-$20.00	$12.00-$20.00

Due to the large number of motels in and around Rapid City, we are not listing them separately. Instead we are asking you to indicate your preference of hotel or motel. Reservations will be made as closely as possible to your request.

Requests for information concerning camping facilities should be directed to Paul Besselivere, Secretary, Black Hills and Badlands Association, Sturgis, South Dakota.

DETACH AND MAIL DIRECTLY TO: **SCSA Reservations Committee**
P. O. Box 1212
Rapid City, S. D.

NAME _____
(Last) (Please Print) (First)

ADDRESS _____
(Street) (City) (State)

DATE OF ARRIVAL _____ DATE OF DEPARTURE _____

METHOD OF TRAVEL _____

NO. IN PARTY _____ NO. OF BEDS _____

NO. OF ROOMS _____ NO. OF BATHS _____

KITCHEN FACILITIES _____ PRICE RANGE _____

NAMES OF OTHER PERSONS IN PARTY:

_____ _____ _____

_____ _____ _____

_____ _____ _____

CHECK PREFERENCE: HOTEL _____ MOTEL _____

No deposit required until reservation confirmed directly by hotel or motel.

I and party of _____ plan to attend convention but do not desire assistance in obtaining reservations in Rapid City, South Dakota.

Iowa SCSA Chapter Photo-Contest

THE STORY OF CONSERVATION can be told excitingly and effectively through photographs. Good pictures properly displayed or published catch the eye of young and old. Lessons can be taught or ideas implanted. We can thus take another step to advance the science and art of good land and water use.

There probably never will be enough good conservation pictures easily available or in the right place at the right time. And, it takes patience to build up top-quality sets. The Iowa Chapter of the SCSA recognized these facts and decided in 1958 through a statewide contest, open to any one, to obtain photographs and slides.

A printed brochure stating the objectives and rules of the contest and listing the prizes was given wide circulation. With the aid of chapter members and others the contest received statewide publicity. Several skilled photographers and conservationists agreed to judge the contest.

Response to the contest was gratifying. About 150 colored and 75 black and white photos and slides were entered by both amateurs and professionals. Many phases of soil and water conservation were covered. A sum of $310.00 was paid out in prizes.

Fourteen of the top pictures were enlarged and framed. These framed pictures have been made available for display in Iowa. This set will help in telling the story of conservation—at fairs, conventions, school events, short course, and appropriate public meetings. The photos are being loaned also for store-window displays and magazine and newspaper stories.

Copies of the framed pictures have been offered for sale. Any income derived will be used in furthering the photo activities of the chapter.

Four duplicated sets of color slides, telling the story of soil and water conservation in Iowa, have been prepared. Each set has a prepared written script. Some of the slides used were obtained from those submitted in the 1958 contest. Already these 2 x 2 inch slide sets have been in heavy demand by districts, garden clubs and school groups.

The Iowa Chapter is pleased with these photography activities. Through the contest much interest and good will was created, for conservation and for the chapter.

The contest will be repeated in 1959. It is expected that coverage of subject matter and entries will greatly exceed that of 1958.

These neatly-framed enlargements of prize-winning black and white and color photographs were exhibited by the Iowa SCSA chapter on several occasions. *(Left-right)* Frank Schaller, immediate past-chairman of the chapter; Ernest E. Behn, chairman of photo-contest project, and Charles R. Ballantyne, 1959 chairman of the Iowa chapter, arrange an exhibit replete with the chapter banner.

Here is the full photograph from which a portion was cropped for use on the May JOURNAL cover. Photographed by E. E. Behn, Boone, Iowa. First prize in black and white.

The colorful fullness of sorghum planted on the contour, along with the satisfaction of a thoughtful conservation farmer, caught the eye of photographer Behn. First prize in color. Many of the color slides entered in the contest will be used in sets released by the chapter.

CHAPTER NEWS

Arizona Chapter has selected "Water Conservation" as the theme for meeting discussions during 1959. On March 17, sixty-two members and guests heard Sol Resnick, head of the Institute of Water Utilization, University of Arizona, discuss "Irrigation Developments in India." Future meetings will feature watershed treatment and yield, total water resources of Arizona and weather modification. According to a letter from Secretary Lloyd H. Howland, the program committee and President Wallace Fuller are working hard to make 1959 an outstanding year for the chapter.

California Chapter charter was presented to Chairman Sven Anderson by Fred Haughton. [This is a correction of a previous news note in the March JOURNAL.] The now disbanded San Francisco Bay Chapter presented the California chapter with a banner, which includes the "California Bear" as well as the SCSA seal and motto. Chapter affairs, and reports of council and sections will be made monthly following meeting of council in a multilithed publication, entitled "Runoff."

Florida Chapter was one of the co-operators in a very well-planned conference on Florida's water resources, held February 12-13 at the University of Florida, Gainesville. In addition to hearing background papers, the conferees grouped into eight concurrent workshop sessions covering policy, administration, competitive uses, finances, rights and laws, quality control, research needs, and legislation needs.

The Chapter is sponsoring a state-wide recognition program involving TV and radio stations and press to honor outstanding contributions in the field of resource-use and conservation. Awards will be presented at the June 19-20 annual meeting in Clearwater.

A slide series on the Asheville meeting and a tape recording of George Browning's talk have been given good circulation in the various areas of the state. The February Newsletter prepared by J. H. Herbert, chapter chairman, contained a good spread of in-state and Society news. Secretary L. M. Hollingsworth noted that the nine Southeastern states and Puerto Rico make up almost one-fourth of the SCSA total membership.

Egyptian Chapter (southern Illinois) met March 20 at the Southern Illinois University, Carbondale. Leon S. Minckler, silviculturist, U. S. Forest Service, discussed "Conflicting Convictions of Conservation." The chapter is working out a plan for the Gramer "soil conservation demonstration" farm which is under the supervision of the Department of Agriculture, University of Southern Illinois. A field trip to the farm will take place in later summer, to observe practices installed. Here is, in total, an excellent project being sponsored by an SCSA chapter. It appears that the Egyptian Chapter is in the midst of an area where much excellent and exciting conservation work has quietly been moving forward in recent years. It appears, too, that this southern Illinois area is the source of much questioning of past practices, with a result that improved and broader concepts bearing on the inter-relationships of resources and people are being developed.

Oregon Chapter held its first annual meeting December 29 at Corvallis in conjunction with the Northwest Scientific Association. Papers were given at the Association meeting by chapter members on a variety of subjects: sand dune control, grass seeding, water loss due to seepage, wildlife management, range management, and forestry. Merril Overson is chairman of the chapter.

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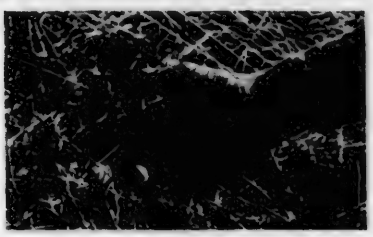

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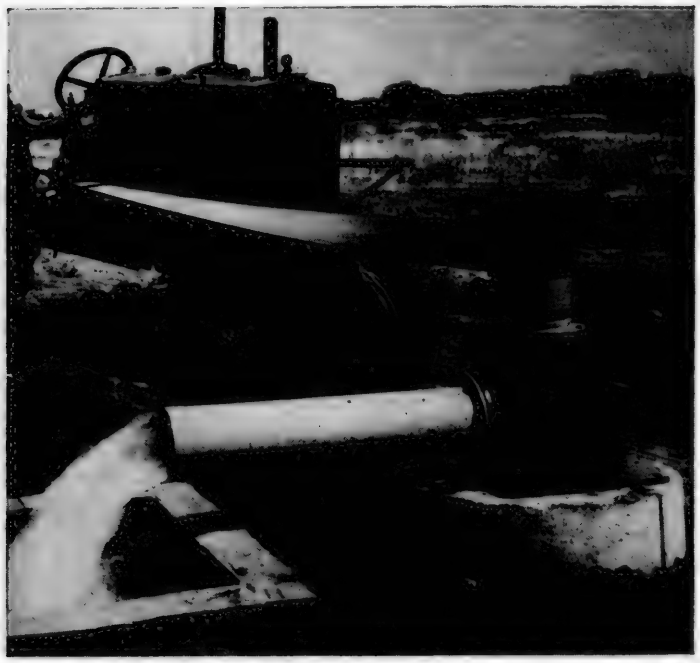

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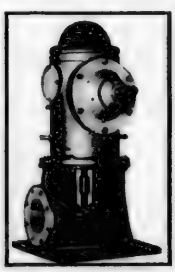

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Northern Illinois Chapter continues, through its council and chapter sessions, to come up with many fine ideas for activities. Most of the ideas get a round-robin discussion from committees, council and members and are then activated. One committee on chapter activities, headed by June Silliman, made the following points: (1) Give each chapter member a job; (2) Get additional publicity on projects; (3) Obtain more College Libraries as subscribing members; (4) Push distribution and sale of Society publications; (5) Provide school libraries and others with a distinctive and usable folder kit for storage of conservation materials supplied by courtesy of chapter; (6) Provide a conservation exhibit for use by schools, libraries, fairs, etc.; (7) Set up a "conservation good-turn" project for members—report on postal cards; and (8) Publicize soil conservation stamp.

The Kankakee State Park conservation-demonstration project is moving ahead rapidly, with excellent cooperation of several agencies and groups.

Fort Hays Chapter (Kansas) met April 4, with 38 members and guests at dinner. Dr. Gerald Tomanek gave a slide talk on the "Beauty of Pasture Flowers." (This is an approach being followed, incidentally, in the Phillips Petroleum Company's series on "Pasture and Range Plants.")

State Council for SCSA Chapter in Kentucky was organized earlier this year. Guiding this fledgling organization are *(see photo), l-r: James Zachary,* secretary-treasurer, Lexington; *Joe Little,* chairman, Bowling Green; and *Wayne Williams,* Murray. The first two officers are associated with the Soil Conservation Service; Murray is with the Kentucky Division of Soil and Water Resources.

Minnesota Chapter, at its annual meeting February 20, toured the Soils Building on the University of Minnesota St. Paul campus and heard addresses on Russia (Dr. Philip Raup); national convention (Harley Larson); and Research in soil and water (Cecil Wadleigh). The February Newsletter featured photos of the Asheville SCSA convention borrowed from the Des Moines office. The newsletter continues a very wide coverage of news related to the chapter, the SCSA, members, publications, coming events, and soil and water conservation progress in the state.

Show-Me Chapter (Missouri) officers met in March. Among other business, the officers considered that these committees were essential to an active chapter: Program, Membership, By-Laws, Editorial, and Nominating. Harry M. Major wrote usual "interest" story for the newsletter. His story was "You'll Never Be Bored with this Board of Supervisors."

Lincoln Chapter (Nebraska) discussed minimum tillage at its February 5 meeting. Dr. Harold Wittmus was the main speaker. Ladies Night was held March 9.

Empire State Chapter (New York) met February 6 at Cornell University for an all-day annual meeting, with 97 members and guests in attendance. In a morning session John Lamb, George Free, and Cecil Wadleigh discussed the research program of soil and water conservation. After a business meeting in the afternoon, the Operation or Action program of conservation was given a good discourse by George Moore, Herbert C. Walker, Edward R. Keil, Lincoln Kelsey, and Albert S. Loucks. The evening program was a banquet, introduction of guests, and a slide talk by Marline G. Cline, professor of soil science at Cornell, on "Soil and Water Management on Farms in Soviet Russia." The chapter will appoint a delegate to the SCSA convention in Rapid City and has set aside $100 to help defray the delegate's expenses.

North Carolina Chapter has kicked off to a good start on a brand new Newsletter co-edited by Joe Adair and Lee Zimmerman. It will be published, with pictures, bimonthly, and alternate with the JOURNAL. A feature covers the Boy Scout conservation project, which has become very popular with many chapters. North Carolina plans to have some 200 or more qualified merit badge counselors available throughout the state so that Scouts can work on the Soil and Water Conservation, Forestry and Wildlife Management merit badges.

Oklahoma State Council will, in addition to holding an all-state annual meeting, build up an active statewide membership committee which is to be headed by Herschel Burrus. The annual meeting is scheduled for October at Stillwater.

Northwestern Oklahoma Chapter met at Panhandle A. & M. College February 24 to learn about research being conducted at the college.

Stillwater Chapter (Oklahoma) issued a mimeographed summary of its 1958 program under the leadership of Edd Roberts. Organization of a student chapter was among its outstanding 1958 accomplishments. Now under the presidency of Russell J. Chance all 1959 committee appointments were made early in the year and projects considered. Close cooperation will be maintained with the Boy Scouts of America conservation program, the Izaak Walton League of America, the student chapter, and several local watersheds, with field tours.

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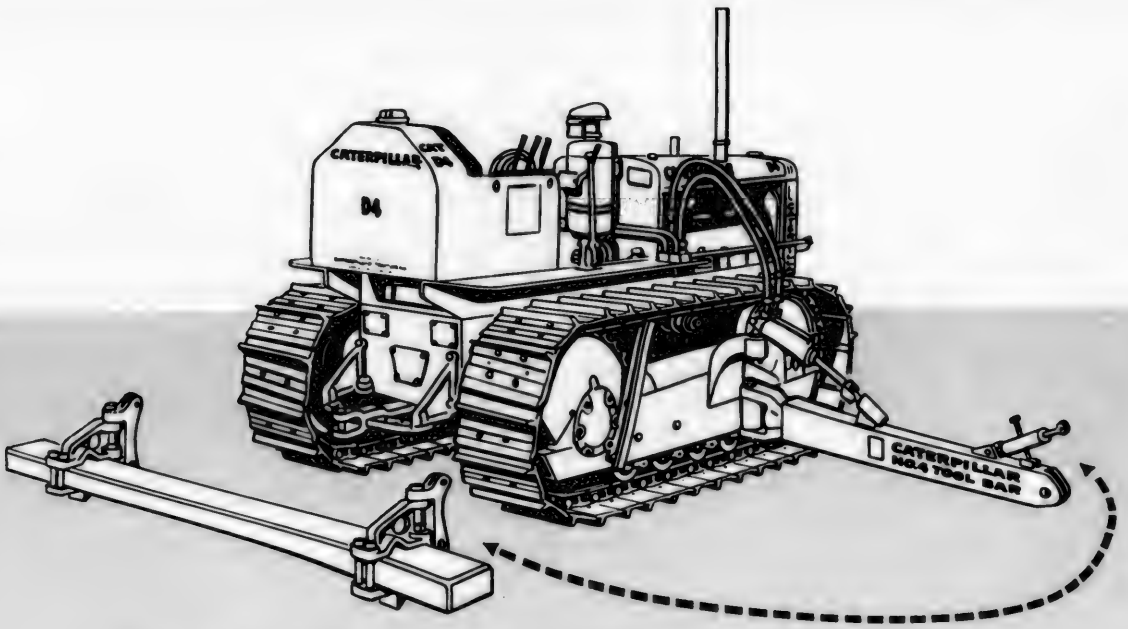

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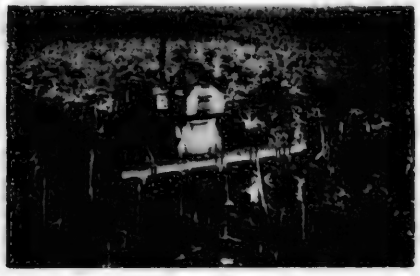

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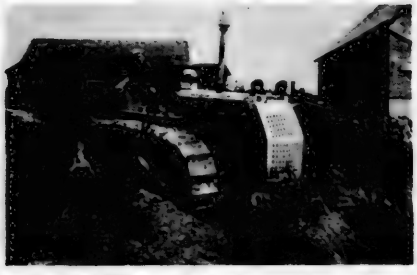

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NEWS OF MEMBERS

H. G. Bobst, state conservationist for Nebraska and council member of SCSA, will become field representative for the Soil Conservation Service in the Great Plains.

Ralph E. Dewey, chairman of the Northwest area of the Iowa SCSA chapter, had some notes on SCSA in the March, 1959, *Iowa Soil and Water*, official publication of the Iowa Association of Soil Conservation District Commissioners. Many SCD supervisors or commissioners throughout the USA are members of the Society through efforts of men like Ralph Dewey.

Charles H. W. Foster, Southern New England SCSA Chapter member, has been named to the post of Massachusetts Commissioner of Natural Resources.

T. L. Gaston now assigned to the Great Plains will transfer to the Southeast as field representative for SCS.

C. R. Gutermuth, Washington, D. C., received the Distinguished Service Award of the NASCD during the organization's annual convention held recently in Houston, Texas. "Pink", as he is affectionately known by his many friends, is associated with the Wildlife Management Institute and is known as one of the "statesmen" of conservation throughout America.

Edgar A. Hodson, Little Rock, Arkansas, was named 1958 *Man of the Year in Service* to Arkansas agriculture by Progressive Farmer. Texas Deputy **Paul H. Walser** received a similar citation for his state.

The Neshaminy Valley Watershed Association Newsletter, March 1959, reprinted **C. R. Humphrys'** article, *Planning for Watershed Management* (JOURNAL, January, 1959). **John T. Carson, Jr.,** of George School, Pennsylvania, is president of the Association and edits an excellent newsletter which is bringing together in watershed cause many interests and people in Bucks County.

Robert S. McClelland has been appointed regional representative for the new NASCD office located in Denver, Colorado.

A. C. McIntyre, formerly woodland technologist with the SCS in New York, is sparking a "Good Outdoors Manners" project for the Pennsylvania Forestry Association.

Frederick A. Mark, Deputy State Conservationist, Spokane, Washington, was given honorable mention for his article, "Meeting Washington's Small Watershed Problems," which appeared in the November 1958 JOURNAL, at a recent press-radio-television award contest for Inland Empire Writers. The contest is sponsored annually by the Theta Sigma Phi Spokane Alumnae. Mark's entry in the National Magazine Free Lance Division, along with 50 other entries in the same division, was judged by nationally prominent writers.

Stan Matzke, Hastings, Nebraska, uses a great deal of Society material, including JOURNAL items and news releases, on his daily radio and weekly TV programs.

Howard H. Michaud, a member of the Indiana Chapter and associated with the Purdue University Department of Forestry and Conservation, and his wife, received the 1959 Chase S. Osborn wildlife conservation award, which consists of a brochure and a $100 check. Both of the Michauds are well-known nationally for their work in conservation education.

Ben Osborn, chairman of the JOURNAL Editorial Board, will lead a seminar on "Principles and Practices of Land Use" in the District of Columbia Audubon Society's Natural History and Field School. There were eight 1-hour sessions weekly. This is one of 12 seminars the Audubon group conducts on a 2-year cycle.

A. H. Veazey recently gave a talk before the North Carolina D. A. R. He outlined problems that face us in conserving soil and water for national defense and pointed up the tremendous values of agricultural lands in peace or war.

Hollis Williams, who is field representative for the SCS in the Southeast will become Assistant Administrator, SCS, with responsibility for flood prevention and river basin work—a new position in the Soil Conservation Service. His assistant will be **Carl B. Brown,** former director of planning division.

Hugh Wilson, Ithaca, New York, is working on a state-wide land-judging contest.

Lee T. Morgan, formerly Utah Deputy State Conservationist, succeeded Idaho State Conservationist, **R. N. Irving,** who retired March 15. **Morgan** was replaced by **Chuck Townsend** of Colorado. **Kenneth E. Grant,** who has been acting, has become New Hampshire State Conservationist. **Ray McDaniel** of New Mexico will join **Ken Chalmers** in Colorado. **Courtney Tidwell** of Texas will go to Albuquerque with Bob Young.

Serving on the Advisory Council to the Outdoor Recreation Resources Review Commission are four SCSA members: **Ira N. Gabrielson, DeWitt Nelson, Lloyd E. Partain,** and **Gilbert F. White.** The Commission was created by the 85th Congress to inventory and evaluate the outdoor recreation resources and opportunities of the nation. Laurance S. Rockefeller is serving as chairman.

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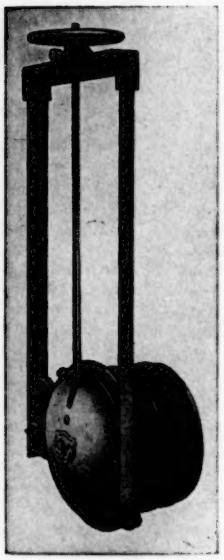

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CHAPTER NEWS

Puerto Rico Chapter was officially organized January, 1959. Thomas U. Yager and Harry Chambers have guided the efforts. Newly elected officers are: David Gomez-Montoya, chairman; Luis H. Rivera, secretary; and Angel T. Berrios, treasurer.

Earl G. Johnson was a guest at the meeting and made many valuable contributions to the meeting. Guest speaker was Ching Po Liu. He gave a slide talk on agriculture and soil conservation in Formosa.

Fort Worth Chapter (Texas) met April 20 and heard discussion on "Zoning in Rural Areas Adjacent to Cities" by C. G. Scruggs, associate editor of the *Progressive Farmer*. Meetings in July and November are planned respectively on atomic radiation fallout problems and a tour of a watershed.

Utah Chapter elected the following officers for 1959: Chairman, John R. J. Bradshaw, Salt Lake City; Vice-Chairman, Robert A. Roundy, Richfield; Secretary-Treasurer, Leonard C. Connor, Salt Lake City.

Virginia Chapter December newsletter contained this squib: Tangibles of Society Membership—You don't buy a newspaper, you buy news. You don't buy life insurance, you buy security for others. You don't buy glasses, you buy vision. You don't buy awnings, you buy shade. You don't buy membership in the SCSA, you buy cooperation of the best informed people in your field and you join with them in getting things done that you cannot do alone.

The chapter is offering $75 in cash to help defray costs to the annual SCSA convention to that person selling the most copies of SCSA publications between now and August, 1959.

The January 22, 1959, newsletter describes many of the inter-relationships that the chapter is building among related state conservation groups.

The Chapter will cooperate with the annual state Institute on Rural Affairs July 28-30: to have an exhibit and handle a three-hour session on soil and water conservation. Other opportunities, to include sessions on soil and water conservation, are being explored or opened up with other state meetings. Thus the communication of vital information moves forward on an ever-expanding front in Virginia. The chapter also sent a $50 check to the Virginia Resource Use Council to aid in teacher scholarships for the annual Conservation Short Course.

Southern New England Chapter (Connecticut, Rhode Island and Massachusetts) held a full program March 24 on the campus of Rhode Island College of Education running the gamut of international relations, space age, individual employment in conservation, education, and the SCSA. From an examination of the excellent press releases, this meeting must have stirred up thinking beyond the immediate confines of the group. *(See photo below.)*

Among the speakers at the S. New England chapter meeting were *(l-r)*: Nibondh Maigate, Bangkok, Thailand; Abdul Majib Khan, Karachi, Pakistan; and Charles H. Smiley, world-famous astronomer, Brown University, Providence, R. I.

"What's a fair price for fertilizer?"

ANYONE who checks into fertilizer prices finds out in a hurry that there is a wide spread in prices. And even though most of us are aware we only get what we pay for, it's still natural to wonder if higher-priced fertilizers are really worth the extra cost. You've probably been asked about it at one time or another.

Whether or not it's wise to pay extra depends, of course, on what is in the fertilizer. This is where a little extra knowledge of fertilizer ingredients and how they work can be a big help.

For example, all potash is not alike. Two sources are muriate of potash and sulphate of potash. Depending on analysis, a fertilizer with sulphate as the potash source may cost $6 to $10 more per ton than one with muriate. If you're not familiar with the difference in performance of these two potash forms, you might decide on the lower-cost fertilizer.

But when you study the difference in yield performance between sulphate and muriate of potash, the picture changes considerably.

Tomatoes ship better

Tomatoes fertilized with sulphate of potash have a lower water content than those fertilized with the muriate source, according to Duke University tests. It means firmer tomatoes that pack and ship better, go through with less damage and spoilage . . . quality advantages worth much more than the small extra cost of a fertilizer ingredient.

Potato quality difference

Research shows sulphate of potash markedly improves starch content and increases specific gravity of potatoes. Curiously, it even takes less cooking oil to make french-fried potatoes if the potatoes have been fertilized with sulphate of potash. It's just another measure of the extra quality potato growers harvest when they rely on sulphate of potash rather than muriate.

Affects potato russetting

Studies show that Russet Burbank potatoes grown with sulphate of potash had 69 percent russetting over more than one-half of their surface area. In one experiment, sulphate of potash increased the uniformity of russetting and improved the market appearance of the russet potato. These benefits plus the advantages of a higher specific gravity potato make sulphate of potash a better fertilizer ingredient buy.

Bean yields improved

Identical fertilizer treatments of lima beans, varying only the potash source, again verified the extra value of sulphate of potash.

Fields fertilized with the muriate source of potash produced yields approximately equal to the average in the test area. With sulphate of potash, however, yields of shelled beans were nearly doubled. Another interesting point: The sulphate form of potash produced higher yields of shelled beans with less vines and pods.

Tobacco quality improves

The University of Kentucky reports "... when too much muriate is used, the chlorine taken up by the plant injures the quality of tobacco." Sulphate of potash contains less than 2.5 percent chloride and is generally recommended by experts as the correct source of potash for tobacco. The sulphur which it provides is important, too, now that sulphur in the soil is being depleted in many areas. The pay-off: high quality tobacco which brings premium bids from buyers.

Extra cost well repaid

Whatever the crop, sulphate of potash brings measurable benefits ... improved quality, better yields, more profit per acre. And since the $6 to $10 more per ton that it costs (over the muriate form) amounts to only $1.50 to $2.00 per acre, it's easy to see that in nearly all cases sulphate of potash is one measure of a fair price in fertilizer.

If you're not already on our mailing list for IMC's Sulphate Bulletin, just fill in the coupon. We'll see to it that you receive the Sulphate Bulletin regularly in the future. It's an excellent source of timely information and news about fertilizers.

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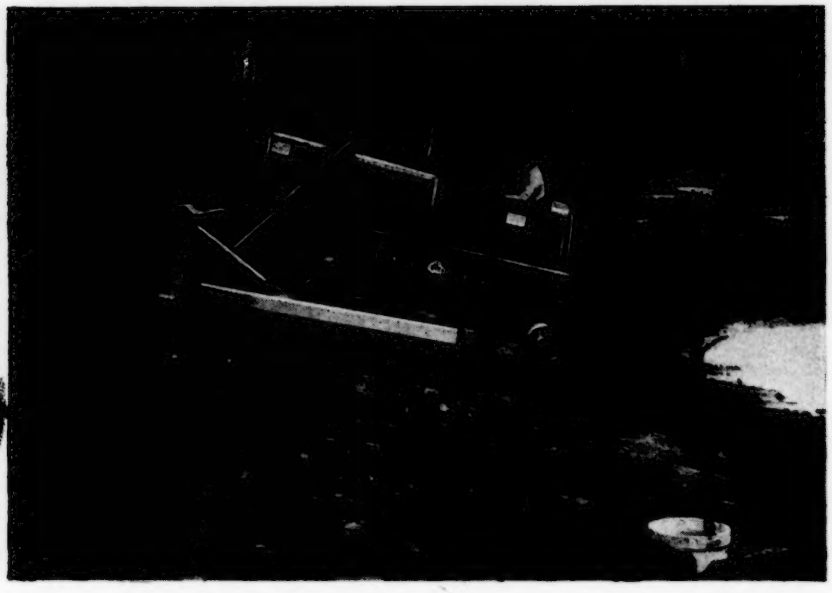
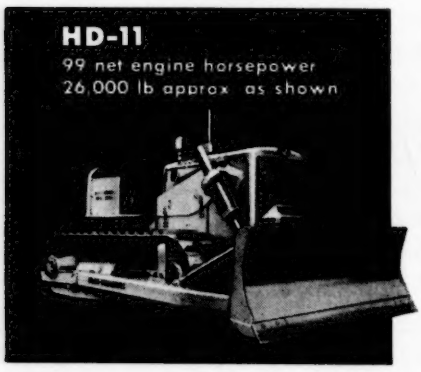


D. R. "Doc" Rice has been building ponds, earthfill dams, terraces and drainage ditches in the Bluegrass State for over 21 years. Here, one of Doc's Allis-Chalmers 99-hp, HD-11 tractor-dozers is completing a water retention structure on a farm east of Taylorsville, Kentucky. The dam has a 20-ft-wide spillway, and a reservoir capacity of 2 acre ft.

20-Year Head Start

Doc Rice *knows* the soil conservation, land improvement business. He was building waterways, flood retention structures, terraces and floodways for 20 years before the Watershed Protection and Flood Prevention Act* got into high gear.



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Here are some of the Reasons Why

Doc gets more tractor for his dollar because he takes advantage of these common sense facts:

1. **Only Allis-Chalmers** offers all-steel main frames in *all* its crawler tractors . . . for better equipment mounting . . . better weight distribution . . . better traction.

2. **Only Allis-Chalmers** offers *Certified* Permanent Lubrication for truck wheels, front idlers and support rollers in *every* tractor model . . . these components are lubricated at time of assembly and need no further greasing regardless of weather or terrain conditions under which they may have to operate.

3. **Only Allis-Chalmers** offers double-reduction, straddle-mounted final drives in *all* its crawler tractors to give you more tractor clearance, longer gear life, less chance of "hanging up."

4. **Only Allis-Chalmers** offers true unit construction in *all* its crawler tractors to give you faster service . . . easier replacement of major units.

So remember these *major* advantages when you buy. Take advantage of the dollars to be made in this giant earth-moving program . . . with the performance and service advantages of Allis-Chalmers construction machinery. Your Allis-Chalmers dealer has all the facts. Let him convince you on a working demonstration of the machine of your choice . . . at your convenience. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

***Public Law 566** has initiated over 120 approved, government subsidized projects already—involving the movement of 175 million cu yd of earth in the fiscal year of 1958 alone. The future promises annual earth-moving projects in the range of 150-to-200 million cu yd.

move ahead with ALLIS-CHALMERS...power for a growing world